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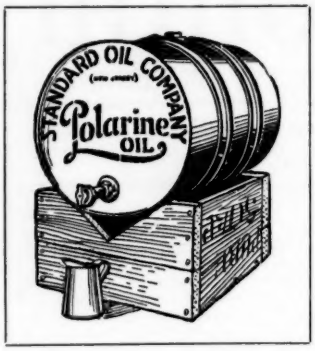

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Original Communications

SOME OBSERVATIONS ON FEVER IN INFANCY.*

By C. G. GRULEE, M. D., Chicago, Ill.

I shall not attempt to discuss with you the various causes of fever but rather I shall endeavor to bring to your attention certain observations which I have made which I feel may have a somewhat deeper clinical significance than is at first apparent. The variation of temperature above or below a certain normal range is regarded by everyone as a sign of some change of a pathological nature within the organism. Fever or variation above this range is a result of a disturbance of one or both of two factors, heat production and heat radiation. Whatever the cause of fever may be these two factors must always enter in. Everyone is familiar with the various agents which have been assigned as causes of fever; chiefly among these there are perhaps bacterial agents, but there has also been a large group of investigators who have produced fever by injury to the nervous system.

While much has been said about the causes of fever and not a little about the mechanism by which fever is produced, very little has been written about the biological changes which take place in the production of fever. In other words, there has been very little attempt to explain how these causative agents act. This is undoubtedly due largely to the fact that it has been impossible to separate fever as a symptom and the conditions which are dependent on fever from the conditions which depend on the causative agent of the fever. That the fever itself may cause symptoms is not at all unlikely, but that several degrees of fever may be present without apparent symptoms is unquestionably true. The best example of such a fever, it seems to me, is the so-called inanition or transitory fever of the newborn. Here, the infant will have a temperature of 102° or 103°, or even 104° without any apparent general disturbance. On the other hand, when this fever reaches 105° or 106°, then we begin to get muscular twitchings, rigidity and the anxious expression upon the face of the child. This would seem to indicate that while there may be little disturbance accompanying fever, if this fever reaches a high degree, it is practically always accompanied by definite clinical phenomena; whether or not these clinical phenomena are the results of the temperature or whether they are due to the agents which cause the temperature would, of course, be impossible with our present knowledge to state.

With these preliminary remarks I will present to you some observations on two infants which were made in the wards of the Presbyterian Hospital, Chicago. I shall ask you to indulge me to the extent of allowing me to go into details on these cases since I feel that such is justified if we are to draw any conclusions whatever from this work.

Report of Cases.

Case 1 (No. 132697).—George G., aged two months, entered the Presbyterian Hospital February 15, 1920. The complaint was vomiting and undernourishment.

History.—The child was born by forceps delivery with a birth weight of 7¾ pounds. Pregnancy had been normal. He was put to the breast but did not nurse well and was fed breast milk with a spoon for some days. After two weeks he was given a mixture of 9 ounces of certified milk, 6 ounces of water, 2 teaspoonfuls of dextrimaltose and 20 drops of milk of magnesia. This was later increased to 10 ounces of milk, 18 ounces of water, 1 level teaspoonful of dextrimaltose, and 4 teaspoonfuls of milk of magnesia. For four days previous to entrance he had been given Horlick's malted milk. The day before entrance certified milk was again tried.

The child had never regained its birth weight and vomited practically everything. The type

*Read by invitation at the fifty-first annual meeting of the Medical Society of Virginia in Petersburg, October 26-29, 1920.

of vomiting was almost projectile. Vomiting became worse. The bowels had been regular, urination regular, the child slept soundly and

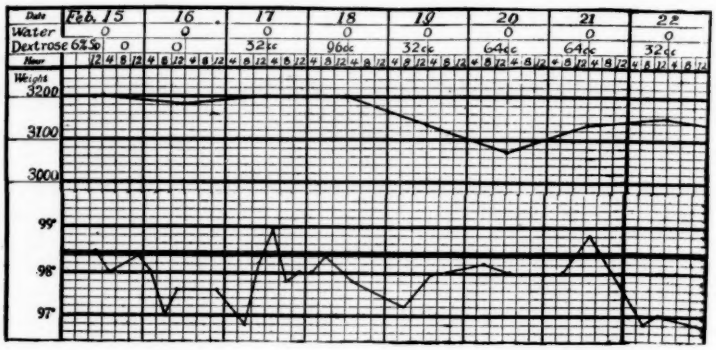

Fig. 1.—George G.; prefebrile period. Food: Albumin milk, 576 c.c.; dextrimaltose, 24 gm. Six feedings of 96 c.c. each.

was good natured. The bowel movements at times had been full of curds and sometimes were loose. There had been no convulsions or spasms.

Family History.—The family history was negative. This was the only child; there had been no other pregnancies. The father and mother were alive and well.

Physical Examination.—On physical examination there was found to be a poorly nourished infant who gave the impression of being emaciated; no skin lesions were noted. The cervical and auricular glands were palpable; the neck was held back but no spasticity was noticed. Lungs and heart were negative; abdomen was distended. No peristalsis was noted at this time, fifteen minutes after taking nourishment, although the stomach was well outlined and there was some movement, but this was not a distinct peristalsis.

February 16, the von Pirquet reaction was negative.

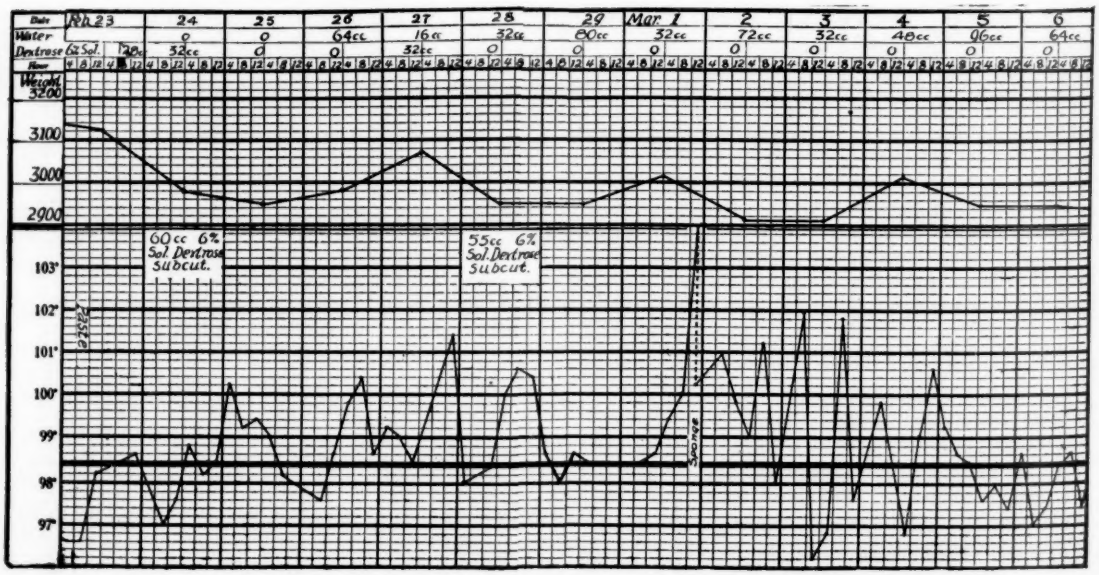

Fig. 2.—George G.; febrile period. Food: Paste made from whole milk, 256 c.c.; dextrimaltose, 24 gm.; flourball, 32 gm.; water 256. cc.

February 17, the child vomited most of its food but seemed to retain enough not to lose weight.

February 18, the baby was rather constipated and still vomited.

February 19, peristaltic waves were seen passing over the stomach and there was projectile vomiting.

February 20, this peristalsis was much more marked as was also the vomiting which was definitely projectile.

Roentgen-ray examination indicated retention of food in the stomach; the stools were hard.

An exploratory laparotomy was done under local anesthesia but no tumor was found and the abdomen was closed.

February 23. During this time the child obtained as food 18 ounces (576 c.c.) albumin milk; ¾ ounce (24 gm.) dextrimaltose, six feedings of 3 ounces (96 c.c.) each. During this period there was no rise in temperature. The child received 6 per cent. dextrose solution, three times a day, beginning with the seventeenth. The child obtained from 1 to 5 ounces a day of this solution (32 to 160 c.c.). February 18, atropin sulphate, 1/1,000 grain, was administered hypodermically every eight hours. This was discontinued on the twenty-third. The stomach was washed before each feeding; this, too, was discontinued on the twenty-third.

The second period is the febrile period, which lasted from February 23 to March 7. During

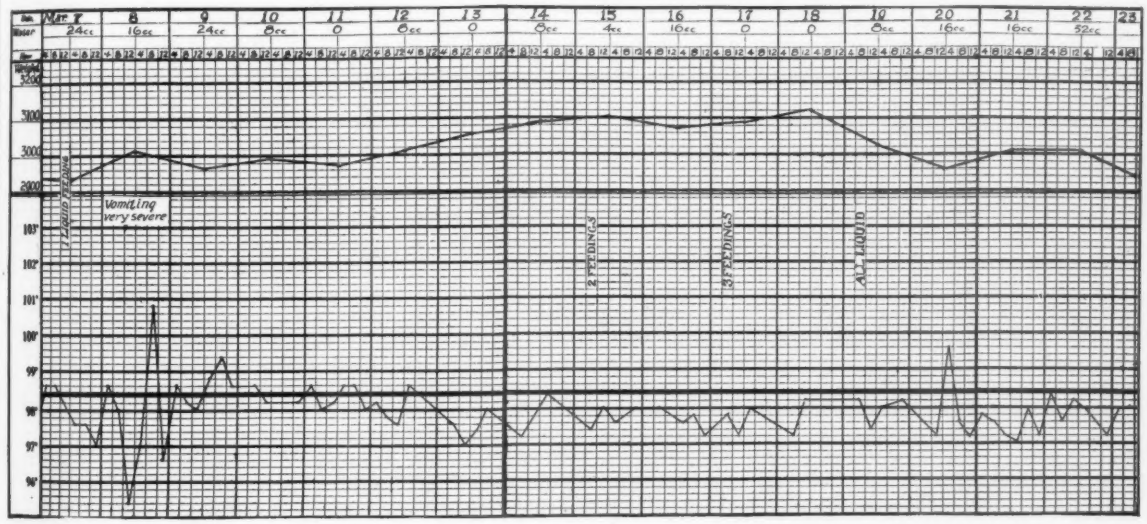

Fig. 3.—George G.; postfebrile period. Food: Each liquid feeding consists of whole milk, 64 c.c.; dextrimaltose, 8 gm.

February 21 and 22 the vomiting was still marked.

February 22, a continuous enema of 6 per cent. dextrose solution was given. This was continued through the twenty-third and the twenty-fourth.

February 25 the child began to retain food.

February 28, 55 c.c. of a 6 per cent. solution of dextrose was given subcutaneously.

Clinical Course.—The course of this case so far as temperature was concerned may be divided into the prefebrile period, the febrile period, and the postfebrile period. The prefebrile period extended from February 15 to this time the child received food consisting of 8 ounces (256 c.c.) whole milk, ¾ ounce (24 gm.) dextrimaltose, 1 ounce (32 gm.) flour-ball, to which 8 ounces (256 c.c.) of water was added and the whole boiled down to a thick paste. Atropin was given, 1/1,000 grain, every four hours; strychnin, 1/1,000 grain, three times a day, both being given hypodermically. An attempt was made to give dextrose solution by the drop method rectally but without much success because the child retained very little of it. The strychnin was discontinued on the third, and on that day the atropin was ordered given only twice a day. Only small quantities

of water were given at this time, varying in twenty-four hours from 16 to 96 c.c. February 28, the child was given 55 c.c. of 6 per cent. dextrose solution subcutaneously.

The third or postfebrile period began March 7 and continued through to the twenty-third. During this period the paste was gradually replaced, one feeding at a time, with liquid, consisting of 2 ounces (64 c.c.) milk, and ¼ ounce (8 gm.) dextrimaltose. The first of these feedings was given March 7. March 15 two feedings were given; on the seventeenth three feedings, and from the nineteenth on all feedings were of liquid nourishment.

During this last period the temperature exceeded 99° F. three times. On the afternoon of March 8, after the child had shown a subnormal temperature, dropping following nourishment, the temperature rose to 100.8° F., dropping immediately to 96.6° F. On the following afternoon, March 9, the temperature rose to 99.4° F., and on the afternoon of the twentieth the temperature at one time registered 99.6° F. With these exceptions, this period was in marked contrast to the period when the child received only a thickened paste. Throughout the treatment the child refused water, the total daily quantity never exceeding ½ ounce (16 c.c.). The urine was negative on several examinations. February 16, the blood showed: Erythrocytes, 4,500,000; leukocytes, 7,500; hemoglobin, 75 per cent. Differential count: Small lymphocytes, 56 per cent.; polymorphonuclears, 44 per cent.

Comment.—Practically the only difference between the second period and the first and third periods consisted in the fact that the quantity of water which the child took was very much reduced in the former. There was no other circumstance which was clinically evident which we could in any way connect with a rise in temperature. It should be remembered that this was an extremely emaciated infant, as the weight curve shows, that it had been subjected to a long period of reduction by vomiting, and that, hence, in all probability the water content of the body was greatly reduced.

Case 2 (No. 133045).—Mary Z., aged 6 months, entered the Presbyterian Hospital, February 27, 1920.

History.—Born spontaneously with a birth weight of about 7 pounds. Breast fed for five months during which time her general condition was good. One month before entrance, the child had a cold and a slight cough. During the daytime the child had been vomiting. Its food at the time of entrance had been four feedings of cow's milk, three parts milk to one of water, with two teaspoonfuls of sugar per bottle, in addition to which had been given one cereal and one vegetable feeding. The child was apparently doing well, although there was a history of some vomiting. Two days before entrance the mother had noticed some discharge from the ear. Previous to this time the child had had no disturbance of any sort. Mother stated she was easy to take care of, took her food eagerly and slept well.

Family History.—This was the sixth child, the oldest being 14 years of age. Two miscarriages; children all apparently well; father alive and well. The mother, soon after the en-

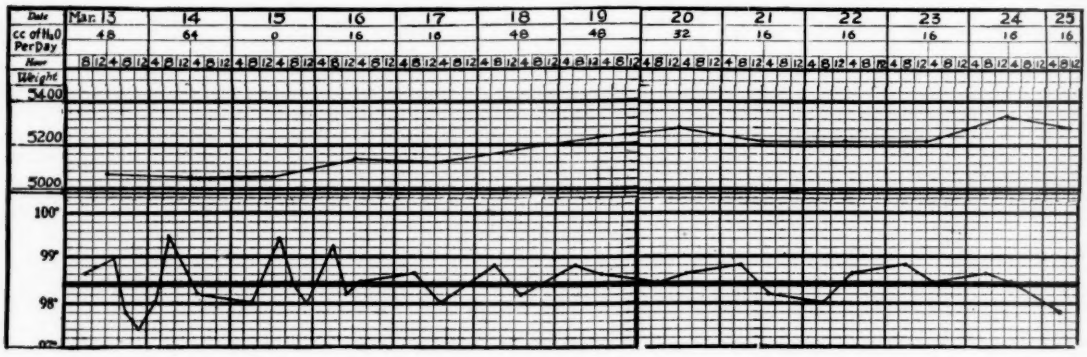

Fig. 4.—Mary Z. First period. Food, March 13: Albumin milk, 1,056 gm.; dextrimaltose, 32 gm. Five feedings of 224 c.c. each.

trance of the child into the hospital, was taken to an insane asylum because of dementia praecox.

Physical Examination.—This revealed nothing abnormal, except that the child was poorly nourished, weight about 10 pounds. There was a somewhat purulent discharge from the right external auditory meatus. Other physical findings were negative.

The discharge from the ear ceased March 3 and never recurred thereafter. During the early days of the child's stay in the hospital its food consisted of 30 ounces (960 c.c.) albumin milk; 1 ounce (32 gm.) dextrimaltose, five feedings of 6 ounces (192 c.c.) each. This was increased to 33 ounces (1,056 c.c.) albumin milk; 1 ounce (32 gm.) dextrimaltose, five feedings of 7 ounces (224 c.c.) each on the ninth. Although the child had been vomiting more or less throughout its stay in the hospital, rumination was first actually noticed March 22, and the food was not changed until March 25.

Clinical Course.—From the time of its entrance to March 25 constitutes the first period in our history. During this period the temperature was nearly always within normal limits. March 2 it rose once to 99.4° F.; March 10 it rose once to 100° F.; March 11 it rose once to 99.6° F., and once to 99.2° F. March 14 the temperature was 99.6° F. once; March 15, 99.6° F. once; March 16, 99.2° F. With these exceptions, the temperature from February 27 to March 25, in all twenty-eight days, never rose above 99° F. During this first period, in addition to the food, the child obtained some water between feedings.

As medication during this first period, from March 13 to March 24, the child received a teaspoonful of cod liver oil and phosphorus twice a day. March 24 this was increased to three times a day and remained the same throughout the course. March 24 the child was given 1/1,000 grain atropin hypodermically, every four hours, and this was kept up for two days when the dose was reduced to 1/2,000 grain and this was continued until March 30.

The second period began March 25. The child was given food consisting of 15 ounces

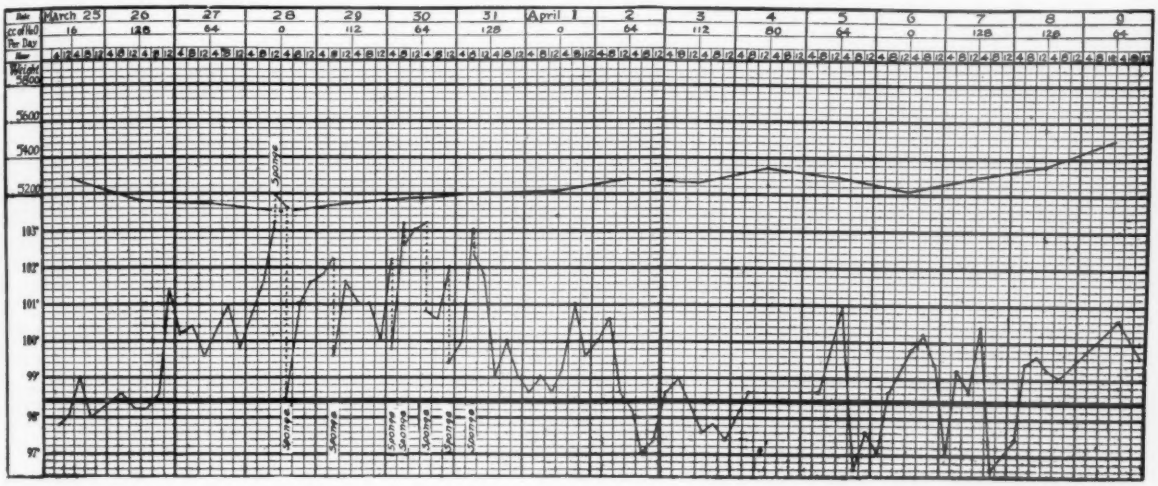

Fig. 5.—Mary Z. Second period. Food, March 25: Paste consisting of whole milk, 480 c.c.; dextrimaltose, 16 gm.; cream of wheat, 48 gm. March 26-28: Paste consisting of whole milk, 576 c.c.; dextrimaltose, 16 gm.; cream of wheat, 64 gm. March 28 to May 3: Paste consisting of whole milk, 640 c.c.; dextrimaltose, 24 gm.; cream of wheat, 64 gm.

(480 c.c.) whole milk, ½ ounce (16 gm.) dextrimaltose, 1½ ounces (48 gm.) cream of wheat, the whole boiled down to a paste and given in five feedings. March 26 this was increased to 18 ounces (576 c.c.) milk, ½ ounce (16 gm.) dextrimaltose, and 2 ounces (64 gm.) cream of wheat. March 28 this was still further increased to 20 ounces (640 c.c.) whole milk, ¾ ounce (24 gm.) dextrimaltose and 2 ounces (64 gm.) cream of wheat. This latter feeding was continued until May 3.

Beginning the afternoon of March 26, the temperature became irregular and remained so until the afternoon of May 3. During this time the quantity of water consumed was very low. The only days when the temperature was

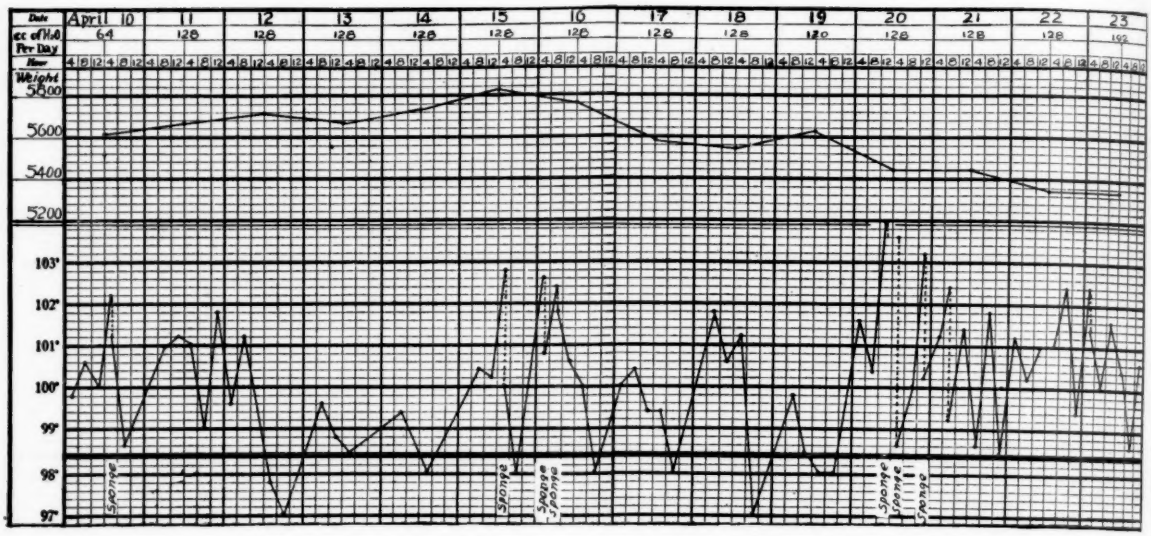

Fig. 6.—Mary Z. Second period (continued). Food: Same.

within normal limits were April 3 and 4. On these two days the quantity of water given was not in excess of that consumed in the other period.

The third period began May 3. At that time the child was given 20 ounces (640 c.c.) milk, ¾ ounce (24 gm.) dextrimaltose, 20 ounces (640 c.c.) water, five feedings of 8 ounces (256 c.c.) each. On the afternoon of May 3 the temperature showed a sudden drop to normal. May 4, in the afternoon, the temperature dropped to 95.2° F. and the child was in a state of collapse. The intern became alarmed and ordered that the child be put again on thick cereal feeding. The condition was so alarming that the child was given camphorated oil, 8 minims, and strychnin sulphate, 1/500 grain, hypodermically. This was continued for two further doses and early in the morning of May 5 it was necessary again to give the child 8 minims of camphorated oil. When the child was seen by the attending man next morning, the liquid food was again ordered and by noon the temperature had dropped to 97.8° F., and in the afternoon it fell to 96.4° F.

This feeding was continued until May 10.

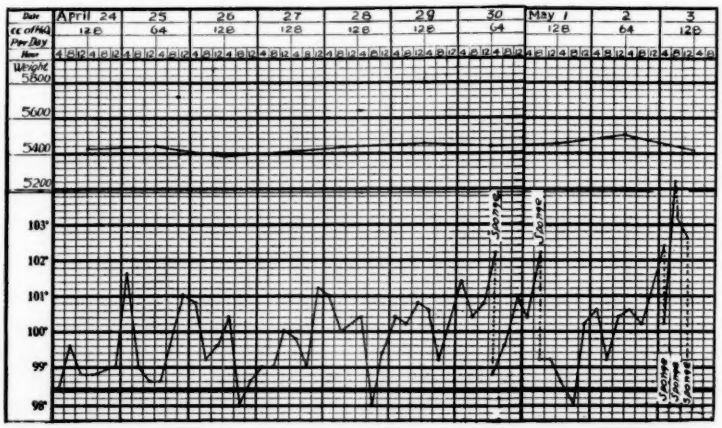

Fig. 7.—Mary Z. Second period (continued). Food: Same.

The temperature became markedly subnormal; on the eighth it rose to 99.4° F., then dropped to 96° F.; on the ninth, it dropped to 96° F.; the morning of the tenth it again rose to 99.4° F., and dropped to normal that afternoon.

In the fourth period, beginning May 10, the child was again put on the paste consisting of 20 ounces (640 c.c.) whole milk, ¾ ounce (24 gm.) dextrimaltose, 1 ounce (32 gm.) cereal in five feedings. This was continued until the fifteenth. During this period the child again showed a markedly febrile temperature.

May 15, when the fifth period began, the child was put on food exactly the same as during the previous period (fourth), except that 20 ounces (640 c.c.) water was added and the whole was not made into a paste, and five feedings of 8 ounces (256 c.c.) each were given. The afternoon of May 15, the child again showed a marked drop in temperature, 96.4° F. This was followed by a slight rise to 100.6° F. the next day. The child was perspiring very freely. The temperature dropped to 96.4° F. on the seventeenth and remained low.

May 25 the food was again changed (sixth period), the same food being given as during the fourth period. The afternoon of May 25, the temperature rose to 101° F. and on the twenty-sixth it rose to 101.6° F. It was decided then to push water, and the quantity, which for the previous ten days had varied between 32 and 96 c.c. per day, was increased so that the following quantities were given:

May 26.....	304 c.c.	May 31.....	384 c.c.
May 27.....	400 c.c.	June 1.....	328 c.c.
May 28.....	208 c.c.	June 2.....	320 c.c.
May 29.....	308 c.c.	June 3.....	448 c.c.
May 30.....	288 c.c.		

The afternoon of the twenty-sixth, the temperature dropped to normal; on the twenty-seventh it was subnormal; on the twenty-eighth it was normal. It was slightly above normal on the twenty-ninth, and the afternoon of the thirtieth it began to rise. From then on until June 3, the temperature remained somewhat high, though lower than in the previous period.

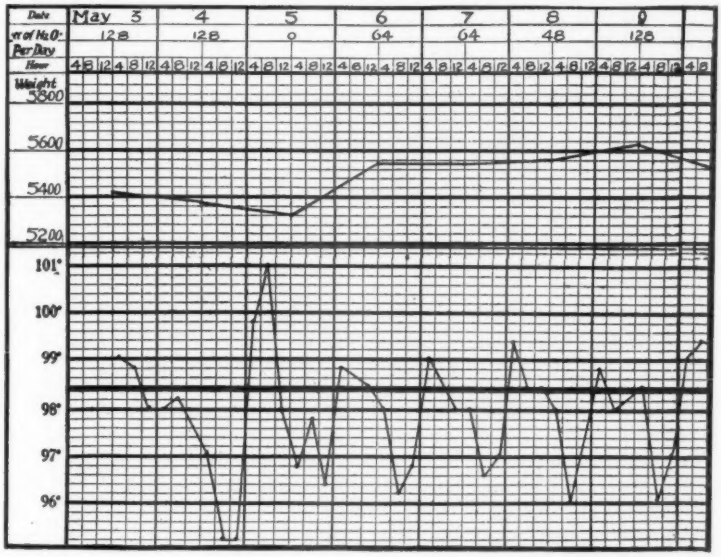

Fig. 8.—Mary Z. Third period. Food: Whole milk, 640 c.c.; water, 640 c.c.; dextrimaltose, 84 gm. Five feedings of 256 c.c. each.

June 3 (seventh period), the food was again changed back to that of the fifth period. The temperature on the fourth dropped to 95.2° F. and remained subnormal with one exception until the fourteenth. On the ninth the temperature rose once to 101° F. This was a hot, humid day.

The quantity of water consumed during this period varied between 64 and 272 c.c.

During the next period (the eighth), from

June 14 to June 25, the same food was given as in the sixth period. June 15, the temperature rose to 101° F., but with the administration of water, 400 c.c. June 16, 336 c.c., and the seventeenth, 360 c.c. water were given and the temperature remained down. Water was restricted on the seventeenth so that the child after that received for this period no more than 96 c.c. per day, with the result, that the remaining part of this period the child ran a febrile temperature throughout.

June 24 (ninth period), the child was again put on a liquid food of the same composition as during the seventh period. That evening, the temperature dropped to 97.2° F., remaining subnormal for three days thereafter, being within normal limits until the end of this period, July 2.

Comment.—The difference in temperature bore such direct relation to the water intake throughout this case that we decided to see if it were possible to obtain any con6rming evidence by blood examination. For this purpose there were made careful estimates of the number of red and white cells, the hemoglobin, and the specific gravity. The sperific gravity was estimated by the benzol-chloroform method, the specific gravity of the liquid being carefully estimated by means of a Westphal balance.

Blood Examination.—The blood examination in each instance was made at 10 a. m., one hour after the ingestion of food.

Table 1.—Blood Findings in Case of Mary Z. During Sixth Period While the Child Was on Liquid Nourishment.

Date	Hemoglobin	Erythrocytes	Leukocytes	Sp. Gr. at 16 C.
6/10/20..	85%	4,790,000	6,700	1.056
6/11/20..	85%	4,864,000	7,650	1.052
6/12/20..	90%	4,998,000	8,600	1.062

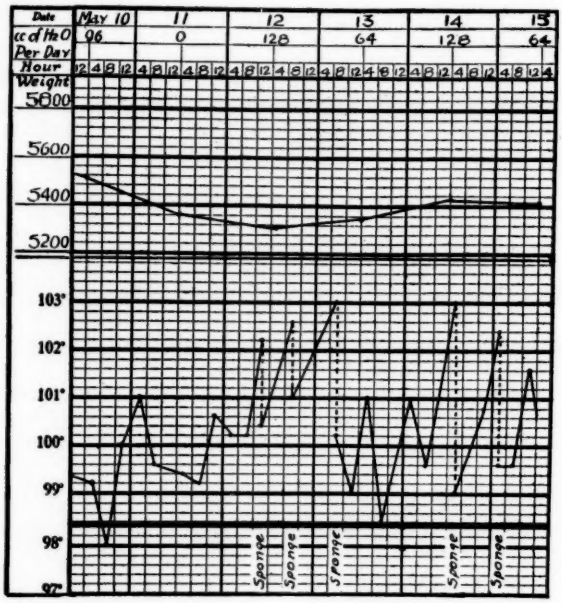

Fig. 9.—Mary Z. Fourth period. Food: Paste consisting of whole milk, 640 c.c.; dextrimaltose, 24 gm.; cream of wheat, 32 gm.

Table 2.—Blood Findings in Case of Mary Z. During the Seventh Period When the Child Was on Food Paste.

Date	Hemoglobin	Erythrocytes	Leukocytes	Sp. Gr. at 16 C.
6/19/20..	95%	5,300,000	9,980	1.072
6/20/20..	92%	5,460,000	9,700	1.069
6/21/20..	95%	5,330,000	9,000	1.070

Comment.—If we may regard the recent observations of Wimberger* as conclusive, this observation of the difference in the concentration of the blood is quite remarkable in that in his observation on children between 7 months and 17 years of age, he found that the variation in the volume of the blood serum was

*Ztschr. f. Kinderh. **25**:64, 1920.

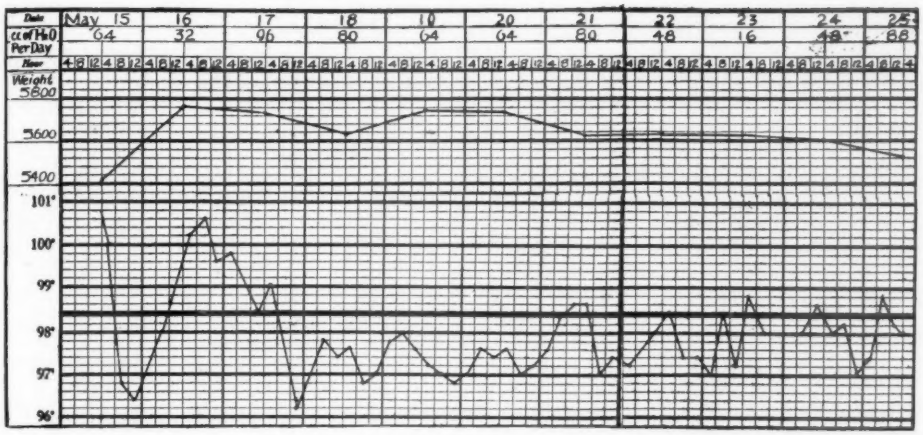

Fig. 10.—Mary Z. Fifth period. Food: Whole milk, 640 c.c.; dextrimaltose, 24 gm.; cream of wheat, 32 gm.; water, 640 c.c. Five feedings of 256 c.c. each.

extremely small, and he thinks that the blood is independent of the water content of the surrounding tissues, even in very marked changes in weight.

When we stop to consider the cause of fever in these cases, we naturally revert to the various theories which have been advanced as the reason for the increase of temperature in the human body. These may be placed into three groups: (1) Fever due to some involvement of the central nervous system; (2) fever of an infectious or bacterial origin, and, (3) dehydration fever. In neither of the cases here reported need we consider the question of fever caused by some derangement of the central nervous system. There was certainly nothing of that nature in either of the cases. Therefore, we must be confined in our discussion to the last two causes; namely, bacterial and dehydration.

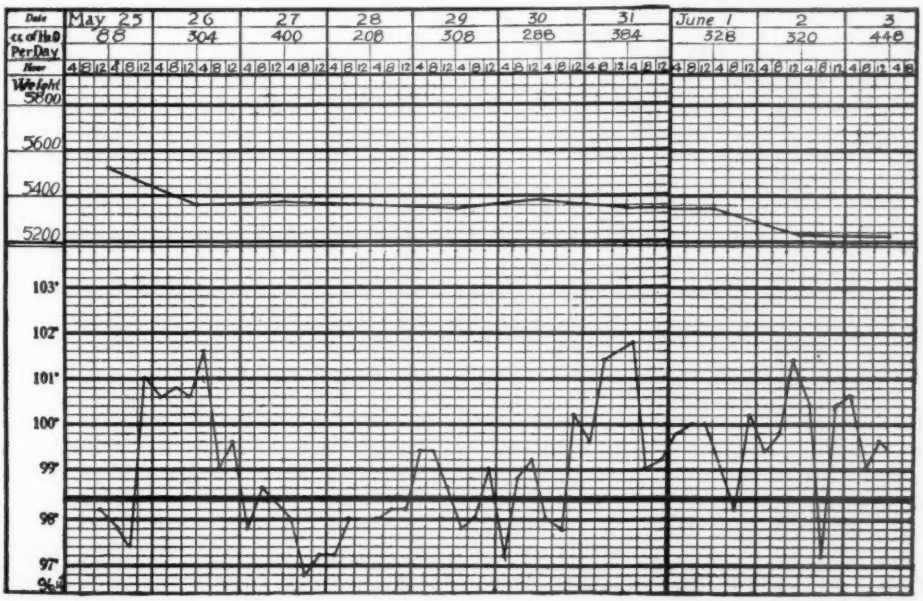

Fig. 11.—Mary Z. Sixth period. Food: Same as in fourth period.

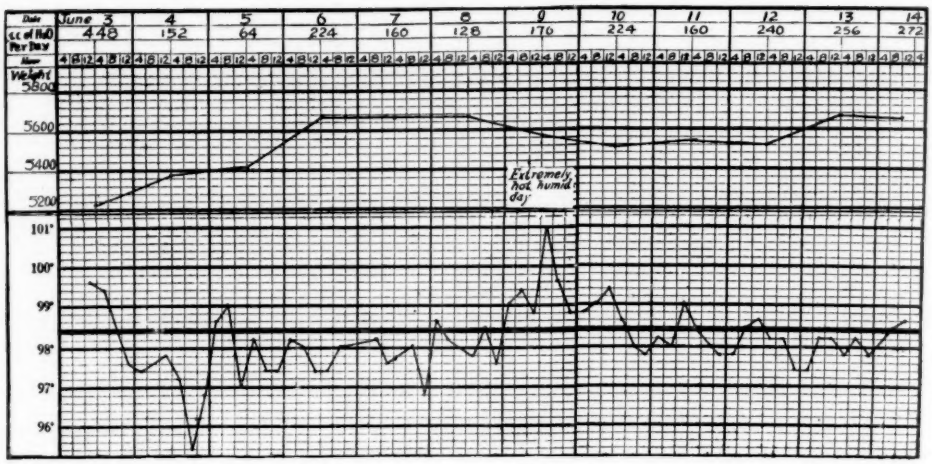

Fig. 12.—Mary Z. Seventh period. Food: Same as in fifth period.

The question that arises in both these cases is whether or not the changed conditions from the removal of water from the food are responsible for an absorption of bacteria from the intestine with a resulting bacterial infection and toxemia. We may certainly dismiss from our discussion any other source of bacterial infection, and we think it fair to assume that there is a very definite connection between the giving of thickened food and the rise of temperature, since in both cases there is evident such a definite time relation between the two conditions, the temperature falling quite evidently as the result of the giving of liquid food. While it would be impossible to state absolutely that there was no bacterial infection, or absorption of dead bacterial bodies under the circumstances above mentioned, still there are many points which speak very decidedly against such a condition. In the first place, although the temperature curve, especially in Case 2, lasted over many weeks, there was at no time any evidence of toxemia. The child was somewhat disturbed by thirst, but no general symptoms of toxemia or septicemia such as are regarded as characteristic of these conditions were to be observed in the child. In the second place, if such infectious conditions did occur, we would certainly expect that there would be shown some evidence of involvement of the gastro-intestinal tract. In conditions due to bacterial infection from the gastro-intestinal tract, or to toxemia produced by conditions within the gastro-intestinal tract, the gastro-intestinal symptoms are practically always in proportion to the height of the temperature. In other words, when temperature elevation depends on a gastro-intestinal disturbance, the number of stools is increased and the character of the stools is changed to a much greater degree than if that same temperature is produced by an infectious process which does not refer to the gastro-intestinal tract.

Diarrhea was not present in either of these cases at any time, nor was there any perceptible change in the character of the stool, no matter whether the child was on the liquid or the solid food. We may, therefore, say that while we cannot absolutely rule out bacterial infection in this instance, all clinical signs point very strongly against such an element entering into the explanation of this fever.

In considering the third cause of fever, dehydration, many points in both these cases, but especially in Case 2, favor such an explanation. First, there is the very definite increase of temperature within a short time after the beginning of the thick paste feeding. Second, there is the continuation of this fever throughout the entire time when the paste is being given. Third, this fever ceases very shortly after the child is put on liquid food. Fourth, for a certain length of time while the child is on thickened food this fever may be reduced by the introduction of large quantities of water by mouth. Fifth, there is distinct evidence of a difference in the water content of the blood.

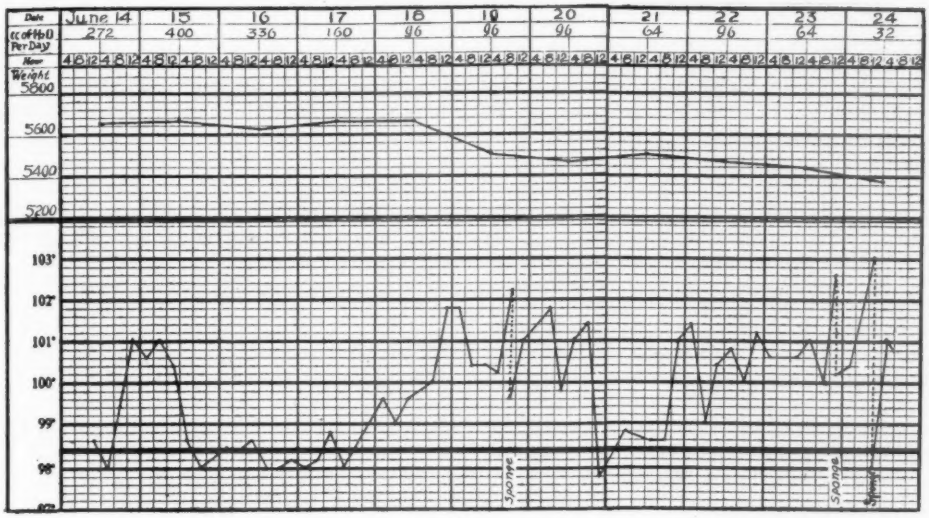

Fig. 13.—Mary Z. Eighth period. Food: Same as in sixth period.

between the period of liquid feeding and that of thickened feeding, the blood being much more highly concentrated during the latter than during the former period.

It seems likely that the water content of the body exists really in three forms; available water, residual water and essential water. If we accept the dehydration theory of fever, and apply it to these cases, it would seem likely that in both cases, due not to malnutrition but to undernutrition caused by the rejection of food through vomiting and rumination, the system of each of these infants had lost any surplus which the body might have contained had these processes not been present. When the paste food was given, therefore, there was withdrawn from the body for the purposes of digestion a rather large quantity of water. The withdrawal of this water resulted in a dehydration, with consequent rise of temperature. When the digestive processes were completed, this water could again be absorbed, with the result that an up and down temperature curve would be produced. That the margin is very narrow may readily be seen by the quantity of water which is sufficient to reduce this temperature. A difference of from 150 to 200 c.c. a day was sufficient to produce a cessation of the fever, at least temporarily. In the first case, too, there was a very definite change soon after the first liquid feeding was given, although the quantity of fluid was very small.

One phenomenon occurred in the last case which we are not able to explain satisfactorily at present, and that is the acute collapse which occurred when liquid food was given following a period of thickened food. It is interesting to note that the collapse was most severe following the prolonged use of the thickened food, and was less marked when the thickened food had been used only a short time. There seemed, however, to be that tendency after each period of thickened food nourishment. The only clinical picture which we know of that corresponds to that seen in these cases is the acute collapse sometimes seen in severely marantic infants. Whether these two conditions are identical or not it would be impossible to say.

The practical importance of these observations suggests itself at once. Fevers of unknown origin have always been described in infancy. There have also been described fevers whose explanation was certainly inadequate; such, for instance, as the temperatures which have been described during teething. Such fevers might possibly, if properly analyzed, fall into a group like that described in this paper. It should be noted, however, that such fevers are to be described only under certain conditions and those conditions must correspond to a dehydration of the organism. Under what conditions the organism is susceptible of showing fever following dehydration, would

be hard to say, but it is very evident that one would expect to find such a state in those infants who had been depleted by severe vomiting.

Another practical point is raised as to whether or not the use of thickened food is justified in the treatment of severe vomiting conditions in infancy; such, especially, as pyloric stenosis, pylorospasm and rumination. In the first place, it should be emphasized that the food used in these cases which we have presented was not simply a gruel but was in reality a thick paste. The water content, therefore, was reduced to the minimum, more, in all probability, than would be true in the ordinary thickened feeding used for the type of case mentioned; but even though the temperature did develop, it would have little effect on the general economy of the child, and could easily be reduced by giving some liquid food. A note of warning, however, should be sounded in these cases as to the manner in which the food is changed. If such a temperature has previously existed, the change from the thickened food to the liquid food should always be made very gradually. We know of at least one child that had pyloric stenosis which died under conditions which in the light of our recent experience could most easily be explained on the basis of an acute collapse following giving liquid food after thickened food was used.

In relation to water content of the body, it would seem that the margin is very narrow between sufficient quantity of water within the body to maintain normal temperature and that present during the febrile period. In other words, after the available water is removed a very slight further reduction will result in the production of temperature. It has been known for some time, and has further been substantiated by Wimberger, that the water available for use by the organism is much more readily obtained from the tissues than from the blood. The question in view of the findings in the last of these cases is raised whether we may regard the water content of the blood as indicative of the state of the organism in relation to the residual water. There was in this instance during the febrile period a very decided reduction in the water content of the blood, as shown by blood counts, hemoglobin estimation and specific gravity. If temperature elevation occurs only when such depletion of the water content of the blood takes place, then we would have a very definite standard by which to judge of the condition in future observations.

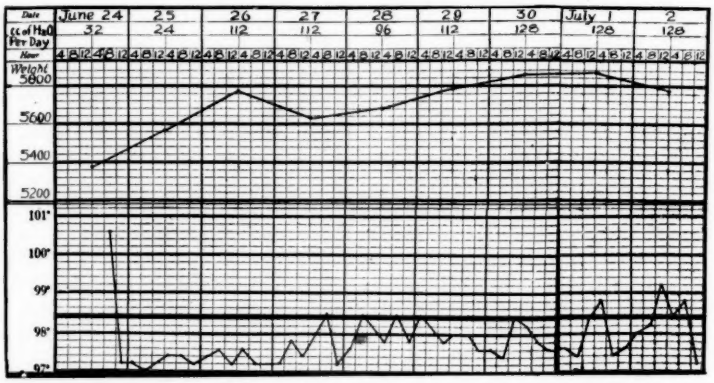

Fig. 14.—Mary Z. Ninth period. Food: Same as in fifth period.

Conclusions.

There occurs in infants who have been depleted by vomiting or rumination following the use of a thickened paste feeding, a temperature curve which can most easily be explained on the basis of dehydration, though it is not possible absolutely to rule out absorption of bacteria as a cause, either total or partial, of this temperature. This temperature is unaccompanied by toxic or gastro-intestinal symptoms and there is evidence of a reduction in the water content of the blood during the febrile period.

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INJURIES TO THE BILE TRACT IN CHOLECYSTECTOMY.

By W. H. GOODWIN, M. D., University, Virginia.

Until recently there has been much debate as to the relative value of cholecystectomy and cholecystostomy with the evidence ever increasing in favor of cholecystectomy. Surgeons were for a long time hesitant about removing a gall bladder unless very grossly diseased because the opinion was so universally held that sometime this gall bladder would be needed to divert the bile stream around a stenosed common duct into the intestine by a cholecystenterostomy. This need is very remote and, since the gall bladder is very much shrunken, thickened, and adherent in the vast majority of cases of stenosed common duct, it does not lend itself to cholecystenterostomy and, therefore, we should not be deterred in doing a cholecystectomy on this account.

The prevailing opinion seems to be that pancreatitis is better treated by cholecystectomy than cholecystostomy with possibly direct drainage of the pancreas itself. In the vast majority of cases, the gall bladder can be more safely removed from within out because by this method the cystic duct and cystic artery can be exposed, in the folds of the gastrohepatic omentum, ligated and divided before the operative field is discolored and masked by the bleeding usually gotten when the gall bladder is first dissected from the liver. However, I am convinced that there are cases in which the exposure is so difficult and the gall bladder is so distended, or thickened and necrotic, that removal from without inward is the best technique. In these cases the peritoneum can be reflected from the gall bladder, on each side near the liver, and the gall bladder stripped from the liver by blunt dissection.

Richter says the peritoneal flaps should not be sutured over the denuded liver but simply pressed in place.

In case the gall bladder is much distended, aspiration is a great advantage.

O'Day, however, says "It is a grievous mistake to open a distended gall bladder before the exact point of the obstruction has been determined, for, the moment it is done, the hopeless surgeon has forced himself to grope within a darkness of his own making." W. J. Mayo lays emphasis on the relation of the pelvis of the gall bladder and the cystic and common ducts.

To grasp the pelvis with a clamp and lift it up aids greatly in exposing the cystic duct. Eisendrath calls attention to the fact that the pelvis may lie on the upper instead of the lower side of the gall bladder.

Concomitant with the great increase in cholecystectomies, we have a great increase in the number of injuries to the hepatic and common bile ducts, and reports of these injuries are creeping into the literature. These injuries are usually not recognized at the time of operation. Cholecystostomy is usually an easy operation compared to cholecystectomy, which procedure must invade much deeper regions and expose much more vital structures to injury.

The question of drainage after cholecystectomy is still unsettled. Richter and Buchbinder recommend that no abdominal drainage be used after cholecystectomy except in the most virulent infection. They also close the common duct quite securely after choledocotomy, omitting all drainage. Halstead recommends that drainage of the common duct be done by passing a small rubber tube through the cystic duct into the common duct. He says drainage is insignificant after removal of the tube from the cystic duct, and after all the chief thing to be accomplished is relief of tension.

We have taken Dr. Halstead's suggestion and drained all of our common duct cases through the cystic duct and are much pleased with the results. We also prefer a small cigarette drain in all cholecystectomies because a small percentage of cases will leak from the ligated cystic duct.

Willis reports good results in cholecystectomy without drainage and advises that the cystic duct stump be excluded from the peritoneal cavity.

Judd states that it is not necessary to remove all of the cystic duct, but, on the other hand, Behrend cautions against leaving a long cystic duct because of the possibility of the formation of a pseudo gall bladder. I think this happened in the third case reported in this paper.

Surely there are a few cases in which the surgeon meets with such difficulties in doing a cholecystectomy that injury to the bile ducts is inevitable, but the vast majority of these in-

juries, I feel sure, are due to errors in technique. One of the most common errors, I believe, is undue traction on the gall bladder which angulates the common duct. Of vast importance in doing a cholecystectomy is a thorough knowledge of the normal anatomy of this region, and the surgeon who would avoid doing serious injury should be familiar also with the anomalies of the bile ducts and blood vessels of this region. Eisendrath has set forth these variations from the normal in a very comprehensive way and I quote from him freely.

The plexus of veins and arterioles which lie on the surface of the common duct is frequently neglected and causes troublesome hemorrhage. The right hepatic artery may course in front instead of behind the hepatic duct. It may parallel the cystic duct or wind around the hepatic duct. The gastroduodenal artery may pass across the front of the common duct or send a branch across the common duct. The cystic artery may arise on the left side of the hepatic or common duct and cross in front or behind one of these in its course to the gall bladder. The cystic artery may arise from the left hepatic artery, main hepatic or gastroduodenal artery. In twelve per cent of individuals there are two cystic arteries and they do not always arise from the right hepatic. Eisendrath reports an injury to the hepatic duct by grasping it with forceps in the attempt to catch a bleeding, retracted cystic artery, after one had already been ligated.

The cystic duct and hepatic duct run a parallel course in 17% of cases before they unite to form the common duct and this union may not take place till one-half or one centimeter above the ampulla. The right hepatic duct may empty into the gall bladder or cystic duct. There may be four or five instead of one hepatic duct. The cystic duct may make a spiral twist around the hepatic duct before they unite. Behrend says the cystic duct joins the hepatic duct on the medial side in 72% of subjects examined and, out of 62 specimens examined, 33% of variations of vessels and ducts were encountered.

Unfortunately, most injuries of the bile ducts are overlooked at the time of operation and either a permanent biliary fistula is established or the stricture of the injured duct results in a progressive cholemia, necessitating many times one of the most hazardous reconstructive operations in surgery.

When the injury of the hepatic or common duct is recognized at the time of the operation, an end-to-end anastomosis of the duct can usually be successfully done. Unless the duct is greatly dilated, the anastomosis should be done over a straight rubber tube or over a T-tube as used by Mayo. This suture line should always be covered with omentum.

Should a section be taken out of the duct leaving such a defect that mobilization of the common duct and duodenum will not suffice to bring the ends of the severed duct together, the proximal end of the distal segment of the duct should be ligated and covered with peritoneum and the distal end of the proximal segment should be implanted into the duodenum or stomach, preferably the duodenum. The mucous membrane of the duct should be accurately sutured to the mucous membrane of the duodenum or stomach over a rubber tube. C. H. Mayo has modified the simple tube used by Sullivan by employing the bell end of an ordinary male catheter over which are cemented two small rings of rubber cut from a larger catheter and so placed that one ring will be in the duct and one in the duodenum, thereby fixing the tube much more securely than can be done by simply suturing. The tube is no doubt eventually passed but remains in situ long enough to greatly minimize the danger of stenosis.

In extensive injuries of the main bile duct resulting in stricture near the fissure of the liver, Mayo would anastomose the greatly dilated hepatic duct to the duodenum with a two-row suture, on the general principle of gastro-intestinal union, covering the junction with omentum. Walton has reconstructed the bile tract by dissecting down a flap of the anterior duodenal wall and suturing this around a rubber tube, one end of which is in the duct and the other protruding into the duodenum. By dissecting down the duodenal flap the suture line is on the posterior aspect of the rubber tube and, to correct this, Gunsburg and Speese dissect up the flap of the duodenum throwing the suture line on the anterior aspect of the tube. This impresses me as quite an ingenious method of reconstruction, but I would be fearful of a duodenal fistula

which should be carefully guarded against in all such operations.

In order to lessen the danger of ascending infection and leakage, Mann constructs a papilla in the duodenum by the use of three tiers of circular sutures in the duodenum around the rubber tube. Eliot recommends that the rubber tube be inserted obliquely into the duodenum after the Witzel method of gastrostomy in order to minimize the danger of ascending infection. O'Day divided the jejunum, anastomosed the distal end of the proximal segment into the side of the distal segment and then anastomosed the proximal end of the distal segment into the bile duct. Rockey, quoted by O'Day, severed the lower portion of the stomach, implanted the proximal end of the divided common duct into the distal end of the stomach, closed the proximal end of the stomach blind and then did a posterior no-loop gastroenterostomy.

In those cases where a considerable portion of the main bile tract is destroyed and it is not possible to mobilize the upper segment and implant it into the duodenum, stomach or jejunum, the Sullivan method of reconstruction is the one of choice. One end of a rubber tube is placed in the lumen of the upper segment of the duct and the other end is passed through the lower segment to project into the duodenum, or, if this is not possible, the tube is passed through a small opening made into the duodenum. All the exposed portion of the tube is now covered with omentum which forms a fistulous tract.

In his first work, Sullivan attached a small rubber sponge to the duodenal end of the rubber tube to facilitate its passage, but later experiments demonstrated that this procedure was unnecessary.

Instead of the Sullivan tube, Mayo uses a T-tube which can be removed. Von Stubenrauch divided the jejunum, anastomosed the distal end of the proximal segment to the side of the jejunum and then brought the end of the distal segment out subcutaneously and anastomosed it to the biliary fistula.

Murphy, quoted by Eliot, made use of a biliary fistula by invaginating it into the exposed distal end of the common duct.

The use of autogenous grafts in bile duct reconstruction has been unsatisfactory and Horsley demonstrated that a transplanted, everted vein would eventually become occluded by contraction resulting from the irritating action of the bile.

Eisendrath has been able to collect fifty-one cases of operative injury to the common and hepatic bile ducts and ventures the opinion that this number does not represent all that have occurred. I am in thorough agreement with this opinion and wish to add two more to this group. During the past thirteen years there have been 486 operations on the gall bladder done in the University of Virginia Hospital. Of this number there were 279 cholecystostomies and 207 cholecystectomies. There were two cases of operative injury to the common duct in this series of cholecystectomies. I do not want to burden you with a lengthy report of these two cases but would like to present the important features.

Case I. T. J., negro woman, 54 years of age, admitted to University of Virginia Hospital, November 9, 1912.

Except for pneumonia in early life, the patient never had an acute illness till three years before admission. She never had typhoid fever. She has always been constipated, taking a laxative nearly every night.

About three years before admission, the patient, early one morning, had a very severe pain beneath the right costal margin and this pain radiated backward and upward to the right shoulder.

This attack lasted two or three days and was accompanied by marked nausea and vomiting. The patient said she had a high fever at that time but did not recall being jaundiced. Since this attack, the patient had to spend about two weeks in bed every month on account of the severe pain, nausea, and vomiting. During the intervals, the patient could work but was never comfortable and had much gastric disturbance. The patient was a fleshy woman and, on examination, the abdomen was found to be quite tympanitic. No mass, but tenderness could be made out on abdominal examination, and her family physician said he found a distinct mass below the right costal margin during the last attack, which was a severe one, and from which the patient had recently recovered.

The abdomen was opened through a high right rectus incision and dense adhesions were found binding the thick and shrunken gall

bladder intimately to the duodenum, stomach, and transverse colon. After separating these adhesions a large stone could be distinctly palpated, apparently in the gall bladder. An effort to expose the cystic duct in the gastro-hepatic omentum failed and it was thought best to remove the gall bladder by dissecting from above downward. This dissection was carried through dense scar tissue with very slight bleeding.

The exposure was difficult and, in attempting to expose the cystic duct, undue traction was put on the gall bladder which angulated the very mobile common duct giving it the appearance of a dilated cystic duct.

The common duct was cut across and this demonstrated that the stone was lodged in the cystic duct at the junction with the common duct and that the gall bladder was contracted around the stone. The section of the common duct was verified by passing a probe through it into the duodenum.

Fortunately, the common and hepatic ducts were dilated and quite mobile allowing resection of that part where the stone was impacted. The proximal and distal ends of the divided duct were approximated and an end-to-end suture with chromicized catgut done.

A linear incision was then made into the hepatic duct above the suture line and a small tube placed and fixed with a chromic gut suture. Cigarette drains were inserted around the tube and suture line and the abdomen closed. On the eighth day following operation the tube was removed.

Twenty-two days following operation all drainage of bile had ceased and the patient was in good condition. Stools continued normal and, one month from date of operation, the patient left the hospital in excellent condition.

A communication of January 28th, 1921, nine years after the operation, states that the patient has never been jaundiced but still suffers from constipation, headache, and indigestion. She has had no severe attacks of gall stone colic.

Case II. Mrs. M. C., sixty years of age, was admitted to the University of Virginia Hospital, July 30th, 1918, complaining of "pain in the stomach running to the right side and shoulder blade." The patient has never had typhoid fever but has had the usual diseases of childhood.

During a period of thirteen years previous to admission to the hospital, the patient has been having about six attacks each year of severe gall stone colic. The patient never noticed any abnormal color of her stools but, during one attack about ten years previous to admission, she says she was jaundiced. On admission the patient's temperature was normal, abdomen flat, and no masses could be made out but there was distinct tenderness over the gall bladder region on deep pressure.

The abdomen was opened through a high right rectus incision and the general cavity packed off with gauze pads. The gall bladder was moderately distended, with thick walls and contained numerous gall stones ranging from a fourth to a half inch in diameter. The common duct was free and the pancreas soft. The cystic duct was somewhat constricted by adhesions forming a goose neck.

Cholecystectomy was distinctly indicated and, in removing the gall bladder from within out, the common duct was cut, thinking it to be the cystic duct. The distal end of the common duct was carbolized and ligated with double ligatures of chromic catgut. The proximal end of the common duct, along with the remaining portion of the cystic duct, was sutured into the duodenum, as the common duct had been cut about three-eighths of an inch below the junction with the cystic duct. The anastomosis was done with chromic catgut, number 0, and fine silk.

One cigarette drain was inserted and the abdominal incision closed.

The patient made an uneventful convalescence and left the hospital in excellent condition. There was never any leakage of bile or duodenal contents. The operator thinks that the extreme mobility of the common duct was a contributing factor toward the accident.

A communication received from the patient on February 1st, 1921, three years after operation, states that she has been quite well and free of gall stone attacks.

The third case I wish to present has for its interesting feature the closure of a permanent biliary fistula and reconstruction operation.

Case III. Mrs. E. C., white woman, thirty-six years of age, entered the University of Virginia Hospital, on October 26th, 1920.

The patient has had the usual diseases of childhood, pneumonia four times, but never had typhoid fever.

In 1913, the appendix was removed and, in 1918, she had a hysterectomy for a fibroid tumor of the uterus. Following this operation she had femoral thrombosis.

In December, 1919, the patient had a severe gall bladder attack and a cholecystectomy was done at this time in another hospital. The patient was informed that her gall bladder was badly diseased and contained two large stones. The patient states that she drained bile through a rubber tube for one week and after the tube was removed she continued to drain bile seven more weeks. It is more than probable that the common duct was explored at this time and drained.

From this time till June, 1920, the patient drained no bile, the stools were of normal color, and she was able to do her household work in comfort. During the month of June, 1920, the patient became jaundiced and the stools assumed a clay color. The jaundice steadily grew worse, appetite failed, and there was pain and tenderness in the right hypochondriac region.

On physical examination, very deep jaundice was noted, and the general appearance was that of a very ill person. There was found enlargement of the liver and its margin could be palpated about four centimeters below the costal border. A very tender mass, simulating a much distended gall bladder, could be palpated below the liver margin. Temperature on admission was 102° and pulse 118.

A high right rectus incision was made, excising the cicatrix of the former operation, and on entering the abdominal cavity many adhesions were found.

The mass mentioned above was adherent to the liver, duodenum, stomach, and transverse colon. The wall of this mass was necrotic and its contents on aspiration were a brownish, mucous fluid. This mass was quite likely a much distended cystic duct, producing a pseudo-gall bladder, which was easily removed.

The common duct could not be identified but, quite near the transverse fissure of the liver, a much distended hepatic duct was found. The duct was opened at this point and a copious flow of bile ensued. No stone could be found in the hepatic duct and the duct below the dilatation could not be probed on account of a dense stricture.

The patient's condition would not permit of any further procedure and, after fixing a rubber tube in the hepatic duct and surrounding it with iodoform gauze, the abdominal incision was closed.

The patient made a very satisfactory convalescence and at the termination of four weeks she left the hospital, discharging all the bile through the fistula and the jaundice had almost disappeared.

Since the operation on October 28, 1920, the patient has shown marked improvement; she has gained some weight, all jaundice has disappeared, and in every respect she seems to be in excellent condition for some operation of diverting the bile into the intestinal canal. The stools have been continuously clay colored and there is no doubt all the bile has been discharged through the fistula.

It was determined to dissect out the fistulous tract, using it as a guide to locate the opening in the hepatic duct. Realizing from the previous operation that the opening in the hepatic duct was very near the transverse fissure of the liver, hope was nevertheless entertained that, after dissecting out the fistulous tract, the duodenum or stomach could be directly anastomosed to the hepatic duct, or that the duct could be reconstructed after the Sullivan method.

The operation was decided upon on February 4, 1921, three months after the previous operation. An elliptical incision was made, excising the scar of the former operation, and the abdominal cavity entered without encountering much difficulty from adhesions.

The biliary fistula was intimately adherent on one side to the under surface of the liver and as intimately adherent to the duodenum on the opposite side. After carrying the dissection of the fistulous tract well down, the adherent wall of the duodenum became indurated and friable. To have carried the dissection of the fistulous tract any further would have no doubt seriously injured the duodenum and repair would have been very doubtful in the presence of the very indurated and friable walls. The biliary fistula had been well open for over three months and would now easily accommodate a number 18 rubber catheter.

The portion of the biliary fistula which had been dissected free was excised. Opposite the lumen of the fistula an opening was made in

the duodenum and already the pathological process had completed a firm anastomosis between the duodenum and the fistulous tract on the posterior and partly on the lateral aspects. One end of a flexible rubber tube with a lumen of one-eighth of an inch in diameter was inserted into the fistulous tract for about one and one-half inches and the other end, about two inches in length, inserted through the opening into the duodenum. The tube was fixed to the fistulous tract and to the duodenum with a No. 1 chromic catgut suture. The wall of the duodenum near the tube was neither indurated nor friable and the duodenum was now brought up over the rubber tube and fistulous opening and sutured to the under surface of the liver with two tiers of chromic catgut sutures. The surface of the liver at this point was smooth and covered with a thick and strong layer of peritoneum which held the sutures quite well. The suture line was then covered with a vascular omental flap held in place by chromic catgut sutures.

One cigarette drain was placed near the anastomosis, one in the kidney pouch of Morrison and the abdominal wound closed.

The patient has been quite comfortable since operation and there has been no leakage of bile or duodenal contents. Every stool has been well colored with bile.

The original drains were removed on the fourth day and now there is only a wick of gauze placed just through the abdominal wall. Two weeks have elapsed since operation and the stools have continuously been normal. The skin is clearer than it has been for a long time and appetite and digestion are quite good.

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THE SURGICAL TREATMENT OF DISEASES OF THE GALL-BLADDER.*

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Lynchburg, Va.

The operative results in the treatment of diseases of the gall-bladder and its accessory extra-hepatic ducts are not perfect; yet, undoubtedly, surgery is to be advised, for, in the present stage of our knowledge, neither external application nor internal medication offers the slightest hope. It is to be regretted that the ingestion of olive oil converts our patients temporarily into soap factories, with an output in the stools of handsful of the erroneously called "Gall-Stones", which can be collected and pointed out as evidence of the efficacy of our treatment. Disinfectants are not known, having selective action on the bile, by the use of which the suspected causative agent, viz: the infection of the gall-bladder and its ducts, may be cleaned up, for, not even the widely used hexamethylenamin, when given in enormous doses, is followed by the presence of formaldehyde in the bile.

Along with the word "Scattered", so often applied as the desideratum of the medical treatment of lumps in a woman's breast, acute attacks of pain in the lower right quadrant of the abdomen, and other strictly surgical conditions too numerous to mention, the misnomer "Indigestion" should be relegated to the days that are past and gone. If used at all, it should be only as the description of a group of symptoms, the true cause of which must be sought for and remedied. In no case is

*Read before the South Piedmont Medical Society at its meeting in South Boston, Va., November 23, 1920.

it to be considered as the name of a disease which is to be treated.

The gall-bladder, the hepatic ducts, or the common duct may be literally packed with stones, the gall-bladder entirely filled with purulent material, or with its walls gangrenous, or even a malignant growth slowly, but surely, progressing past the operative stage without the presence of jaundice. How foolish it is, then, to allow the absence of this symptom, which is but the evidence of the more or less complete obstruction to the outflow of bile, influence us to delay our diagnosis. To go a step further, we must remember that neither pain nor the presence of stones is necessary before operative interference is indicated, for, according to Barker, "It is not the diagnosis of gall-stones that is most important, what we desire most to know is whether or not stagnation and infection exists anywhere in the biliary tract."

I would add to this, as a possible causative factor in the production of gall-stones, the theory of the existence of the hypercholesterinemia diathesis as suggested in the work of Rothschild and Rosenthal, and a further statement that, with sufficient drainge, the cholesterine content of the blood will return to normal.

It would seem that all this is rather a discussion of some of the symptoms and possible causes of gall-bladder diseases rather than of their surgical treatment. It is not, but only a plea for quicker diagnosis, less medical treatment, or rather procrastination, and earlier surgical intervention.

Lyon's method of promoting drainage by means of repeated irrigations of the duodenum with magnesium sulphate solution, based on Metzger's discovery that a relaxation of the sphincter like muscle of Oddi at the ampulla of Vater can thus be caused, may yet remove the treatment of gall-bladder diseases from the realms of surgery, or, at least, such of these diseases as are dependent on the presence of stasis, infection, or the result of the combination of these two, viz: stones. Before this much-to-be-desired result can be hoped for, however, means for making our diagnosis before the formation of stones too large to pass through the ducts must be given us.

In his article on "Operation and Re-operation for Gall-stone Diseases," Deaver reports, in one series of 1,000 cases, 4.07 per cent. re-operations, in another series of 800 cases, 8.5 per cent. re-operations. In 51 of his own cases there were 36 recurrences after cholecystotomy and 15 after cholecystectomy. Later he states that, after cholecystectomies, the percentage of recurrences was 1.3, while after drainage operations the percentage was 10. The causes for re-operation he lists as follows:

For Recurrence of Stones	26
For Cholecystitis	27
For Fistulae	11
For Common Duct Obstruction	10
For Chronic Pancreatitis	8
For Cholangeitis	6
For Pyloric Obstruction	5
For Dilatation of Ducts	5
For Carcinoma	4
For Stricture of the Ampulla of Vater	2

Adhesions were encountered in 39.

Even in view of this report which shows a far from perfect result in the treatment of these cases, operation is not only the method of choice, but the only hope for a complete cure.

It is not wise, on account of the possibility of spreading the existing active infection, to operate during an acute attack. Pain should be relieved and relaxation induced by hypodermics of morphine, the application of ice bags, and absolutely no food by mouth. If it is necessary to evacuate the bowels, enemata are indicated rather than purgatives by mouth. This will usually make the much-to-be-preferred interval operation possible. In thus temporizing with an acute attack, due consideration must be given to the possibility of the presence of a gangrenous, or even ruptured, gall-bladder or duct. If even the imminence of such a condition of affairs is suspected, immediate operation should be performed.

A severe grade of infection may exist within the gall-bladder with no marked increase in the septic factor of a blood count unless the inflamed viscus is surrounded by an adherent omentum, or the infection has involved adjacent structures.

The position of the patient is most important. A sand bag or, preferably, an inflated, cylindrical, rubber bag placed under the patient's back, at the lower edge of the thoracic cage, renders the field of operation, especially

the ducts, much more accessible. The rubber bag is softer for the patient and, in addition, can be emptied of air on the completion of the operation without moving the patient or disturbing the dressings. The removal of the support simplifies the closure of the wound. Again, the drains must be placed with the support removed, or the change of the position of the incision into the duct, from close to the skin incision to its normal distance from it, will leave the drains no longer in contact with the point to be drained. The inclination of the patient should be slightly downward toward the feet, in order that the intestines may have a tendency to gravitate into the pelvis and lower abdomen, and thus be more easily packed away from the field of operation.

Several incisions have been suggested combining free access to the gall-bladder and ducts with conservation of the nerves and muscles of the abdominal wall. The right rectus incision gives good exposure and, with careful closure, does not result in post-operative hernia. If more exposure is needed, the right rectus can be converted into a Mayo-Robson by extending its upper extremity inward and upward through a portion, or all, of the right rectus muscle. Kocher's incision runs parallel with the costal margin and about one inch from it. That of Bevan adds to Mayo-Robson's a further extension from the lower end of the wound toward the right, both upper and lower extensions being slightly curved to produce the so-called "S" shape. Moynihan describes the additional incisions of Don, Perther, Courvoisier, and Kehr. He further calls attention to the fact that a long skin and fat incision adds much to the exposure secured by a muscle incision comparatively short without taking away from the strength of the abdominal walls. This is especially true in the case of fat people with thick abdominal walls.

Cholecystotomy, with removal of stones and subsequent closure of the opening in the gall-bladder, is to be condemned. Kelly states, however, that this operation is still practised by no less an authority than Kocher.

Cholecystotomy, with drainage, consists in exposing the gall-bladder, thoroughly packing off the surrounding viscera with gazue pads, aspirating the bile with trocha and cannula, incising the fundus, carefully removing all stones, and inserting a large sized, cuffed, rubber tube. The opening in the gall-bladder is closed tightly about this tube with catgut stitches, at the same time controlling the bleeding, and one or more including the wall of the tube in order to anchor it in place. It is advisable so to place these stitches that the raw edge of the gall-badder incision will be inverted into the lumen of the gall-bladder so that when the tube comes away, which will be about the ninth day, peritoneal surfaces will be left opposed to each other, thus promoting a more rapid closure of the resulting biliary fistula.

Care is to be taken, during the aspiration of the bile, that the resulting collapse of the gall-bladder does not leave areas of the surrounding structures unnecessarily exposed.

I have described the steps of this operation rather in detail although, like Meredith's method of closure of the gall-bladder following the removal of stones, it is fast becoming obsolete. It is still the method of choice in the hands of those not thoroughly trained in surgical procedures, when the condition of the patient, and of the operative field, renders more radical measures unsafe, when the pathological condition, as, for example, stricture of the common duct due to carcinoma of the pancreas, indicates the necessity for a side-tracking of the bile by an anastomosis between the gall-bladder and the stomach or the duodenum, or when its removal is operatively impossible. Otherwise, it is now almost universally conceded that cholecystectomy is to be preferred.

This operation consists in the ligation of the cystic duct fairly close to the common duct, and, after dividing it, a ligation and division of the cystic artery close to the gall-bladder. The peritoneum is then split up each side of the gall-bladder which peels easily from its bed. The peritoneal flaps are allowed to fall back, thus covering in the raw area left by the removal of the gall-bladder. A rubber tube drain is usually placed down to the ligated stump of the cystic duct and a small cigarette drain placed against the flaps of peritoneum to hold them in closer approximation with the bed of the removed gall-bladder. Add to this, if you choose, the method proposed by Willis and others of doubly ligating the cystic stump, covering it with peritoneum, and completely

closing the abdominal incision without drainage, and we have the ideal operation. The infected gall-bladder and cystic duct, either one or both containing stones, have been removed without opening and, therefore, without the possibility of spreading the contained, infected bile, and the danger of post-operative adhesions minimized by the omission of drainage. However, until further reports have made me ashamed of my timidity, I will continue the use of a safety valve in the shape of a drain, considering the risk of troublesome post-operative adhesions as less than that of the slipping of a ligature on the stump of the severed cystic duct.

In performing this operation, as in all operations on the ducts, invaluable aid is given by the rotation of the liver outward and to the right as proposed by Mayo-Robson.

Were it not for the close relationship of the various ducts and vessels and, especially, because of the frequent wide departure from the normal in number, size, course, and location of both arteries and ducts, the operation would be easy. In their discussion of these abnormalities, Eisendrath and Behrend have called attention not only to the possibility, but almost the certainty, of sooner or later having troublesome hemorrhage from the unligated part of a double cystic artery, death from the ligation of a misplaced hepatic artery, or dangerous stricture from the wounding or ligation of an abnormal hepatic or common duct, and other unfortunate probabilities too numerous to mention.

A correct understanding of these occasional anatomical abnormalities, plus a proper exposure of the ducts and arteries, is essential. The exposure is obtained by opening the right free border of the hepato-duodenal ligament. Through this incision the cystic duct and cystic artery can be seen and identified even in the presence of abnormalities. For this same reason, block ligation of the cystic duct and artery, as well as the method of freeing the gall-bladder from above downward, is not the safer course.

Mayo calls attention to the troublesome hemorrhage from the raw surface of the liver following cholecystectomy in acutely infected cases and advises splitting the gall-bladder by two lateral incisions, turning down the anterior flap, removing the mucous membrane from the posterior section, and leaving still attached to the liver the outer coats of the posterior wall.

This same method is to be adopted in those cases in which adhesions render cholecystectomy unduly difficult or dangerous.

In the operation of choledochotomy, first portion, the outward rotation of the liver, as described above, is almost a necessity. This step brings the ducts into plain view. The common duct is identified and, if a stone is present, this is located by palpation. Before an incision is made into the identified duct, it is wise to aspirate with a fine hypodermic needle to make assurance doubly sure. Two stay sutures are then placed in the walls of the duct, immediately over the stone, if it is in, or can be moved into, a suitable location. An incision is made into the duct, the stone removed and a rubber drainage tube inserted. Care must be taken that no abnormally placed artery lies anterior to the duct, the wounding of which may cause severe and troublesome hemorrhage.

Even here, Richter and Buchbinder advise, in selected cases, that the incision in the common duct be closed tightly with fine needle and suture material and the abdominal wound be closed without drainage. In choledochotomy, even more strongly than in cholecystectomy, the use of one of the various forms of tubes for drainage appeals to my sense of the fitness of things. A straight rubber tube inserted into the opening and turned up toward the hepatic duct, anchored by a catgut suture, which is used also to close the incision in the duct tightly about the tube, answers splendidly. T-tube that will not interfere with the passage of bile into the duodenum, double drainage tubes, and other forms, are recommended by various authors.

The same procedures are to be adopted when an incision into the hepatic ducts is rendered necessary.

In a great proportion of these cases, the operation of cholecystectomy is combined with that of choledochotomy. In this connection it is interesting to note the observation of Courvoisier, quoted and agreed to by Mayo, that in obstruction due to common duct stone 84% show atrophic gall-bladders, while in obstruction due to pancreas or ampulla 92% show dilated gall-bladders. In the first, cholecystectomy would be advisable, while in the latter a cholecystenterostomy would be indicated.

XUM

Jacobson quotes that 85% of all pancreatitis cases have gall stones, and 20% have common duct stones, also that 7% of gall stones have pancreatitis. Since drainage of the duct is indicated for the relief of pancreatitis, we have another argument against the method without drainage.

If the stone is impacted in the second portion of the duct and cannot be brought up into the first position, an incision is made into the peritoneum to the outer right side of the duodenum and this is turned to the left, exposing the retro-duodenal portion of the duct, the stone removed, the incision in the duct carefully closed, and drainage established through a second incision in the first portion.

For stones impacted in the ampulla, or the third portion of the common duct, the transduodenal route is the method of approach. In this case an incision is made in the long axis of the duodenum, opposite the ampulla of Vater, the ampulla dilated or incised and the stone removed. No closure of this splitting of the ampulla is necessary. The incision in the duodenum is closed as usual. Drainage, when indicated, may be established through an opening in the first portion of the common duct.

Attention has been called above to the danger of damaging one of the hepatic ducts, or, especially, the common duct, in the operation of cholecystectomy. The present popularity of this operation renders such accidents more frequent. The results range from slight stricture of the unintentionally wounded duct to complete destruction of portions of it. The treatment consists in removal of the damaged portion and end-to-end anastomosis over the buried tube of Mayo. In this connection, Downes states that the common duct will regenerate in 35 days if one-half the circumference is anastomosed. The tube may remain buried for months or even years, or be promptly passed and give rise to no trouble. Eisendrath calls attention, in repair of the ducts, to the use of the omentum where the destroyed duct tissue makes a gap inevitable. If an end-to-end anastomosis be not possible, then the proximal end of the duct is to be inserted into an opening in the mobilized duodenum, if possible; if not, then into the stomach. In this, Mayo states that the end of the duct can be sutured to the mucous membrane. In this operation, also, the buried rubber tube is to be used.

In an anastomosis between the fundus of the gall-bladder and the stomach, the gall-bladder is inserted into the opening rather than attempting an edge-to-edge union.

In malignant growths the entire involved area must be removed. The results, as regards permanent cures, have not been brilliant. Where side tracking operations for obstruction to the flow of the bile, due to malignancies, are possible, life is prolonged and relief afforded.

It is to be remembered that long continued or deep jaundice with its resulting marked delay in the coagulation time of the blood, or subcutaneous or submucous hemorrhages, contraindicates operation on account of the certainty of fatal post-operative bleeding. Blood transfusion pre-operatively to prevent bleeding, or post-operatively to check the oozing, is of marked benefit. Whipple reports even better results from the intravenous injection of from 200 to 500 c. c. of a 0.2% solution of calcium lactate. This drug is used per oram for the same purpose but with doubtful effect.

Re-operations, where dense and extensive adhesions are present, are extremely difficult. I have lately had such a case in a woman 60 years of age. The scar of the old right rectus incision was removed and the abdomen entered with difficulty by a continuation of the incision upward. The liver extended two fingers' breadth below the costal margin and was strongly adherent to the anterior abdominal wall. After carefully freeing this, the fundus of the atrophied gall-bladder was finally located. The liver could not be rotated, while widespread and dense adhesions prevented the usual exposure of the common duct. Through the fundus, the gall-bladder was opened into and found to contain no stones. The incision in the gall-bladder was continued down to the cystic duct which was in turn opened throughout its extent. At its termination the opening was continued for a short distance along the anterior surface of the common duct. With a finger in this opening, a stone was located in the hepatic duct and removed without difficulty. No further effort was made to free the adhesions. A tube was inserted for drainage in the usual way and the patient made an uninterrupted recovery. A short time later the same method was tried in a woman of 62 years of age who gave a history of having had her first gall stone attack at the age of 23. Innumerable severe attacks had occurred since.

These repeated attacks had left the abdomen about in the same condition as the first case. Without attempting to separate adhesions, the gall bladder and ducts were split as described above and a stone located in the retro-duodenal portion of the greatly distended common duct. This was easily brought up into the first portion and removed. The convalescence was easy and the result excellent.

In both these cases, as the incision extended toward the common duct, previously unrecognizable structures were easily identified. No step was taken blindly but in plain view. No troublesome bleeding was encountered, and two extremely difficult cases, the re-operative one, I believe, otherwise impossible on account of the age and condition of the patient, were rendered comparatively easy.

1315 Church Street.

DEMOGRAPHY.*

Demos (people); Graphein (to write.)

By W. A. PLECKER, M. D., Richmond, Va.
State Registrar of Vital Statistics.

This is a broad term embracing a study of all phases of human life, particularly:—

1. Genealogy.
2. Eugenics.
3. The Census.
4. Vital Statistics: birth, marriage, divorce, sickness and death.
5. Biometrics: the study of human growth, stature, strength, etc.
6. Pathometrics, or statistical pathology.

While the term and developed science of demography are of recent origin, some phases of it are as old as the human race.

Adam was a hundred and thirty years old when he begat Seth. If we refer to the genealogy of our Lord as recorded in Luke, 3rd Chapter, we will find a perfect ancestral record back to the first man. Long before the days of Christ, Egypt, Persia, Greece, Rome and China, as well as the Hebrews, kept demographical records.

However interesting other phases of demography may be, our present studies will necessarily be restricted to vital statistics.

In England the registration of baptisms (or births), marriages and deaths, reaches back to 1538 when Thomas Cromwell issued an injunction requiring the clergy to make on each Sunday, in a book kept for that purpose, an entry of baptisms, marriages and burials during the previous week.

The modern registration of births, marriages and deaths in England dates from 1836, while compulsory registration began in 1870. Twenty-five years after the first English settlement in America, at Jamestown, the General Assembly of Virginia in 1632, enacted a law requiring a minister or warden from every parish to be present annually at court on the 1st of June and present a register of burials, christenings and marriages.

Seven years later, the Massachusetts Bay Colony, in 1639, adopted a requirement for the keeping of marriages, births and deaths.

In 1692 Massachusetts by further enactment put the registration of births and deaths upon a more definite basis.

It is a matter of interest to know whether any of the first vital statistics records of Virginia are today in existence. Few county records have probably escaped fire, war and careless handling for nearly four hundred years.

The oldest Virginia records of births and deaths now available for the State, were secured by the Commissioners of the Revenue as they called upon the householders once a year, for the purpose of assessing their property for taxes. Inquiry was made at the same time as to births and deaths that may have occurred in the family.

Copies of these records were made and forwarded to the State Auditor once a year by the county and city clerks. These were in 1918 transferred to the Bureau of Vital Statistics and are now arranged for ready reference covering the period from 1853 to 1896.

The record of marriages from 1853 to the present are also in the care of the Bureau of Vital Statistics, and are now sent in annually by the clerks, during the first two months of each year, for the year preceding.

In 1918, under an act of the legislature, divorces likewise became reportable by the clerks.

The registration of births and deaths is now secured under modifications of the Model Law in most of the other States of the Union. As each State is found by U. S. Bureau of the Census test to be securing the registration of 90% (ninety per cent) or more of the deaths

*Summary of Introductory Lecture on Vital Statistics to the Senior Class of the Medical College of Virginia.

and births, it is admitted to the Registration Area for one or both. The U. S. Census annual tables and reports are made from copies of the original certificates secured by the registration states.

Value of Vital Statistics.

Vital statistics constitute the foundation upon which public health work is based and are valuable in proportion to their accuracy and completeness.

Morbidity Reports.

Complete and accurate morbidity statistics of preventable diseases is one of the three pillars upon which public health work stands. While for permanent and final study nothing can take the place of birth and death registration, deaths constitute the end result and are the records of the failures which were not prevented by physicians, citizens and health officials working in unison.

It is only by the immediate reporting of preventable, not necessarily communicable, diseases to alert and prepared local and state health officers, that the most efficient and productive health work can be done.

In this connection, it is a matter of great interest to attempt to draw the line between the preventable and non-preventable causes of death. As this line is gradually extended, the time seems to be approaching when only degenerative diseases, the result of age, will be left.

The functions of health departments and governmental responsibility are gradually extending. Perfection, the goal towards which our dreams are directed, seems to be growing less distant.

Birth Reports.

Of the physical events in the life history of the individual, his birth is first and most important. The recording of this event, like that of his death, depends entirely upon the faithfulness and honesty of others. The infant at his birth is powerless to foresee the many demands which modern society will make for his birth certificate. He does not know that the correct record of his birth is one of the important links in the chain which binds together all forms of child welfare work.

The intelligent and painstaking physician, however, possesses the knowledge and extends the protection. No other is worthy of the important and responsible duty of accoucheur, nor is he deserving of the endearing title "Our Doctor."

Birth registration in Virginia and elsewhere is now required for proving age for school enrollment, child labor, securing war benefits, and for many legal purposes. The fate of many a Virginian has hung, and will hang, upon his ability to prove from the vital statistics records that the girl he has betrayed is beyond the age of consent. The most frantic appeals have come to our office for birth certificates in these cases. How will it be in the future, now that birth registration is required?

A Virginia soldier is now unable to return to America with his German bride because he can produce no birth certificate.

Even now there is great demand for birth certificates to use in securing passports to foreign countries. In the future the demand will be more imperative.

Questions of heirship, legitimacy, etc., may be quickly and effectually settled only by properly certified copies of birth certificates from the Bureau of Vital Statistics.

These are some of the reasons why birth registration is of value to the individual.

The real value to the State of complete birth and infant death registration is to study, with a view to prevention, the high death rate of infants during the first year of life. In the United States, one death out of every six is an infant.

In some of the mountain counties of Virginia, one-third of the deaths are of infants, and even then all the deaths are not registered.

Time does not permit me now to dwell upon the details of the nearly six thousand infant deaths in Virginia each year, 75% of which are preventable, under favorable conditions, even now while with proper eugenic control and the eradication of syphilis, 90% of infant deaths after several generations may be considered preventable.

Death Registration.

When the Model Law which went into effect in Virginia on June 14, 1912, was under advisement, the U. S. Bureau of the Census considered death registration alone as fully worth the cost of maintaining the bureau. This estimate was entirely justified by facts, as actual health conditions began to be revealed with the study of our death certificates.

The Health Commissioner, during the first

year (1913) of death registration, learned that he had 709 deaths from typhoid fever each year to prevent, and took up this definite task to accomplish. Could he have known without vital statistics that by 1919 he would have more than cut this death rate in half?

How would the tuberculosis fighters have known without death registration, that in 1915 Virginia had 4003 deaths from that cause, and that in four years it would be reduced by 558?

Who would have known, had not the Bureau of Vital Statistics dragged the information from reluctant physicians, that 497 women died in childbirth during 1917, many, however, being listed as deaths from peritonitis, septicaemia, uraemia, eclampsia, acute nephritis, hemorrhage, etc., all end results, with no mention of the dread term "puerperal"?

Legal Uses of Death Registration.

Transcripts are more frequently requested of certificates of death for the collection of insurance claims than for any other purpose. They are at present in much demand by the War Pension and War Risk Insurance Bureaus, as evidence of death.

Death certificates are frequently needed in the settling of estates, and to prove the right of the widow to remarry.

Eventually, vital statistics records will be invaluable for establishing gynecological facts.

When attention is simply called to these various needs for birth and death registration, it would seem that reference to the necessity of having them legible and accurate is entirely superfluous.

A few minutes' examination of the bound volumes of birth and death certificates will reveal the gross carelessness and apparent indifference of some physicians and other persons, in the discharge of this important duty to family and State.

It is pleasing to note the painstaking care which the leading and most successful obstetricians of the State use in making out their birth certificates. This care is but a reflection of their habit of performing all of their professional duties in the best manner of which they are capable. These men, though they may attend one or two hundred births a year, never raise the plea of being too busy to make prompt and correct reports of them.

On the other hand, I can scarcely recall a man of shady moral, professional or business reputation, who has not laid himself open to criticism from our office, for wilful and repeated disregard of the law and the rights of his patrons.

Some men of standing and character have for a while not realized the importance of placing this simple duty upon the same footing as the clean skillful handling of their patient.

One or two gentle reminders are all that men of this type require.

Model Law.

The Model Law is the basis upon which the States successful in securing good registration of births and deaths are working.

The essentials of this law are local registrars in every community of the State, appointed by and supervised by the State Registrar from the central office, or Bureau of Vital Statistics, usually at the State capitol or chief city. The local registrar is in charge of a definite district or township or portion thereof, and is alone responsible for registration within his territory. In Virginia the effort is made to place registrars eight or ten miles apart so that none will be required to travel much over five miles to record a death and secure a burial permit. In many localities, however, they are nearer, and in others further apart.

The feature of death registration is the burial permit which is required before a funeral can be conducted legally. This is secured by filing a complete certificate of death with the local registrar before removal or burial of the body. The undertaker or person acting as undertaker (head of the family) is responsible for making the return. The undertaker shall secure from the family answers to all of the questions on the form, except the cause of death. He is then to present the certificate to the physician last in attendance, who is to write and sign a statement as to the primary cause of death. This certificate is then to be delivered to the local registrar, or his deputy, who shall issue a burial permit therefor.

The registrar shall assure himself that the certificate is complete and accurate, write on it the date of filing and sign.

Births are to be reported within ten days by the physician or midwife in attendance, or by the head of the family if there was no attendant. These certificates are to be copied into books provided by the State Registrar for

the purpose, and mailed to the central office on the tenth of the following month.

The entire work of securing and compiling vital statistics depends upon the correctness of these original reports. Though this seems a simple matter, experience shows that many capable physicians fail to familiarize themselves with the essentials of a correct certificate and force upon the State office the great burden of writing thousands of letters of inquiry for essential facts omitted or improperly stated.

This subject will be discussed in detail in a subsequent lecture when you will be shown the requirements of a correct certificate and the most frequently made mistakes to be avoided.

Perhaps half of the physicians of the State make out their certificates in a legible, painstaking manner, that marks them as physicians who may be depended upon to render a correct diagnosis and to perform all of their duties in an intelligent and professional manner.

I would estimate that half of the remainder will make a mistake but once when attention is called to it. The remaining twenty-five per cent are careless to varying degrees, and perhaps ten per cent of the physicians cause our office ninety per cent of our trouble.

The labor and cost, consumed in the effort to overcome the neglect of this small part of the medical profession, is the one problem we are facing in our effort to secure the accurate and complete registration of all births and deaths.

I beg each of you to familiarize yourself with the requirements of correct certificate writing and, when you enter into practice, do not thrust yourself into the delinquent class, and force every clerk in the office of the Bureau of Vital Statistics to rate you with the undependable part of the profession.

ACUTE PYELITIS.*

By A. I. DODSON, M. D., Richmond, Va.
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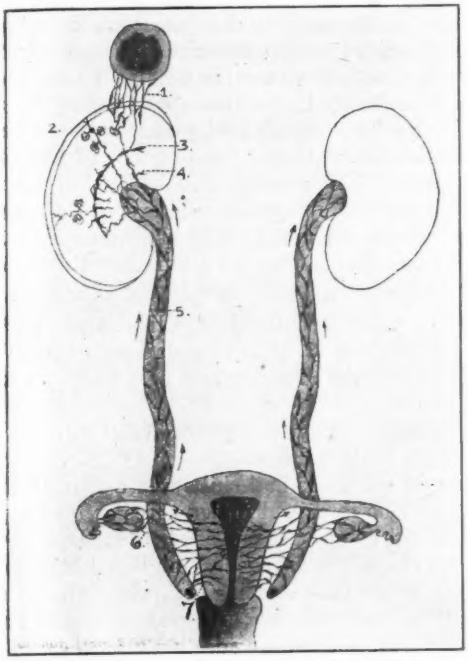
During the past eight months there have been admitted to St. Elizabeth's Hospital seven patients suffering with acute pyelitis. Two patients were admitted with a diagnosis of acute appendicitis, one of whom was operated upon. In one case a diagnosis of pelvic inflammation had been made and one patient had been treated ten days for malaria. One had pyelitis complicating pregnancy, and one pyelitis with multiple stones in the pelvis of the kidney. In addition to these, another patient developed acute pyelitis following a pelvic operation. The frequency of this condition and the number of confusions with other diseases in so few cases prompt me to present our observations.

*Read at quarterly meeting of Southside Va. Medical Association in Petersburg, March 8, 1921.

Pilcher, in his very excellent text-book, "Modern Cystoscopy," describes pyelitis as an acute catarrhal inflammation of the lining membrane of the pelvis of the kidney, usually associated with dilatation of the pelvis and congestion of the kidney parenchyma. It is often unilateral and most frequently on the right side. Most prominent among predisposing causes is some incomplete obstruction such as may arise from an impacted calculus, twisted ureter, stricture of the ureter or pregnant uterus. Infection may be carried to the pelvis of the kidney either through the lymph channels or the blood stream. When we notice that the lymph supply of the rectum, sigmoid, bladder, ureter and kidneys drains into a common lymphatic system and that these lymph channels pass in close proximity to the kidneys on their way to the receptaculum chyli, and also that the lymph current is under very low pressure, it seems much more probable that organisms reach the kidneys in this way than either along the urinary current or by extension along the ureteral wall.

Eisendrath and Schultz, in the study of the path of involvement in ascending infection of the urinary tract, (Journal of Medical Research, January, 1917) cited experiments by Gerota, Bauereisen, Kumita and others, showing the presence of an anastomotic network of the lymphatics in the wall of the bladder and the ureter communicating above with a similar lymphatic network in the renal pelvis. This system also communicates with the lymphatics of the pelvic structures both in the male and female. They showed by animal experimentation that both motile and non-motile organisms were easily transported from the bladder to the kidney by the lymphatic stream in the ureteral walls and that almost complete obstruction to the free passage of urine is necessary for the ascent of infection by way of the lumen of the urinary tract. They also showed

that pyelitis and pyonephritis, not secondary to pyelitis, may also be the result of lymphatic transportation of infection from the pelvic organs in the male or female and from the lower intestinal tract.



Relation of the lymphatics of the ureter to those of the internal genitalia of the female. 1. Lymphatics from the cortex of the kidney. 2, 3, and 4. Lymphatics of the parenchyma of the kidney (Kumita). 6. Communication of the periureteral lymphatics. 5. with those of the uterus, tubes and ovaries. (Copied from Eisendrath and Schultz. Journal of Medical Research, January, 1917).

The frequency with which infection enters the kidney pelvis by the blood stream is evidenced by the occurrence of pyelitis during acute infectious diseases and in suppuration in other parts of the body. One of the cases in our series seems clearly to have been caused by a suppurative process in the knee joint.

Since the kidney's function is the elimination of waste and undesirable products from the body, doubtless numerous organisms are presented by the blood for extrusion daily and it is only natural that at times, being impaired by one of the above mentioned or some other predisposing cause, the kidney pelvis may become fertile soil for their implantation and growth.

The colon bacillus is the most frequent offender but staphylococci, streptococci and the bacillus subtilis are also mentioned as causative organisms. Colon bacilli were cultured from three of our cases. In three cases no culture was made, and in one the culture was negative.

Acute pyelitis is usually characterized by the sudden onset of severe pain in the lumbar and lower abdominal regions. There is tenderness and often hyperaesthesia and rigidity of the muscles of these parts. The patient often has a chill and is nauseated and vomits. Three of our patients had chills and four complained of nausea and vomiting. Frequent painful urination is mentioned as a valuable sign. It was not present in any of our cases. I believe it will only be found when there is an accompanying cystitis or ureteritis.

The urine of the majority of the cases here reported contained considerable pus and a moderate amount of albumin. The urine of two patients, however, had very few leucocytes when admitted and a bare trace of albumin. In three there were a few red blood cells in the urine, while the majority showed acetone and diacetic acid.

On cystoscopic examination the trigone is found markedly congested and edematous, more so on the infected side. The corresponding ureteral orifice is congested and pointing and often cloudy urine can be seen coming from it. If the condition is unilateral the other orifice will appear normal. Ureteral catheterization will definitely establish the diagnosis.

The leucocyte count will depend greatly upon the freedom of drainage. In four of our cases there was a moderate leucocytosis, ranging from 11 to 16 thousand. In three, the leucocyte count was normal. All except one showed a relative increase in polymorphonuclear leucocytes.

The following case histories will illustrate some of the difficulties met in diagnosis:—

Mrs. T. D. W., age 39, entered St. Elizabeth's Hospital, August 31, 1920, complaining of nausea and vomiting, and pain in the lower abdomen. Her family history was negative.

Past History.—For several years she had had occasional "cold shakes" followed by a little fever. Four years ago she was operated upon for "female trouble" and has had a scant leucorrhoea for the past year.

Present Illness.—On August the 23rd, she was taken with severe pain throughout the ab-

domen, accompanied by nausea. On the following day the pain was not so severe, and it seemed to radiate from the small of the back on both sides downward into the pelvis. Physical examination was negative with the exception of general abdominal tenderness and slight distention. Her leucocytes were 6800, polys 86. Urinalysis showed a trace of albumin and many leucocytes. During her first three days in the hospital she had one chill each 24 hours, temperature going up to 104. Repeated examinations for malarial parasites were negative. During this time she was unable to retain even water by mouth and was given fluids by hypodermoclysis. During the following week her temperature ranged from 99 to 101 and gradually returned to normal. On September 11, cystoscopic examination revealed a moderately congested bladder mucosa and no difference in the appearance of the two ureteral orifices. Urine from the left kidney contained a large amount of pus. Urine from the right kidney was clear. Colon bacilli were cultured from both specimens.

The presence of vaginal discharge and pain coming on suddenly throughout the abdomen accompanied by general tenderness and distention would certainly lead one to think of pelvic infection. Her history of malaria and the presence of chills and fever, with a practically normal blood count, is usually indicative of malaria.

Mrs. C. A. S., age 53, admitted to St. Elizabeth's Hospital, December 8, 1920, complaining of chills and fever. Family history and past history uneventful.

Present Illness.—August, 1920, she had an attack of chills and fever lasting about a week; at the same time she noticed some pain and swelling in the right knee. The condition in the knee progressed until October 22, 1920, when she came to the hospital and was operated upon, the diagnosis being septic arthritis. She was discharged November 6th, improved. At this time she had 6000 leucocytes and 70 per cent. polys. Urine contained a trace of albumin and many white blood cells. She continued to improve until December 1st, when she again began to have chills and fever which persisted until December 8th, when she was again admitted to the hospital. On admission she looked quite sick, temperature 98, pulse 116; no pain nor tenderness at any place and considerable improvement in the condition of the knee. Blood count 9000, polys 55. Urine contained more albumin than at previous admission and still considerable pus. The following day she had a chill, temperature going to 103. On December 10th, cystoscopic examination revealed a moderate inflammation of the bladder with considerable edema of both ureteral orifices. Urine from both kidneys contained a large amount of pus. Frequent cultures failed to reveal the presence of any organisms. This patient also had a low blood count and no symptoms whatever to lead one to suspect inflammation of the kidneys, with the exception of pus and albumin in the urine.

Mrs. L. R. B. entered St. Elizabeth's Hospital, December 19, 1920, complaining of pain in the right side. Family and past history were negative.

Present Illness.—She gave birth to a healthy child October, 1920. After being up about a week she had chills and a pain in the back. She remained in bed three or four days and the symptoms subsided. On December 18th, she was awakened at night with intense pain in her back and in the lower right quadrant of the abdomen; she was nauseated and vomited. The following day she was admitted to the hospital. She had a temperature of 102, pulse 118, and appeared quite sick. There were intense tenderness and muscular spasms in the right lower quadrant of the abdomen and considerable tenderness in the lower right lumbar region. Leucocytes 15,480, polys 78; urine showed a trace of albumin, a few white blood cells and an occasional red blood cell. The likelihood of pyelitis was thought of in this case but, because of the marked spasm and tenderness over the appendiceal region, it was thought unwise not to operate. When the abdominal cavity was opened, a moderate amount of blood tinged fluid was found. The appendix was found to be congested throughout its peritoneal surface. It was removed. The lower pole of the right kidney could be easily palpated and was tense and congested. She continued to have intense pain in the right lumbar region and lower abdomen with temperature of 101 and 102 until December 22nd, when cystoscopic examination showed a moderately congested bladder, con-

siderable edema about the trigone, and the right ureteral orifice markedly swollen. Catheterization of the right ureter showed a large amount of pus from that side. Motile bacilli were seen but no culture was made.

Pyelitis and infection of a post-cecal appendix or an appendix lying low in the pelvis and adherent over the ureter are always confusing. I recall a case in which the patient had many bladder symptoms, frequent and painful urination, and a considerable number of pus and blood cells in the urine. Operation revealed an appendiceal abscess. The appendix sloughed off, and was found floating free in the abscess cavity, one wall of which was formed by the bladder and another by the pelvic peritoneum under which the ureter passed.

The most important factors in making a differentiation between acute pyelitis and infections of the abdominal viscera are a carefully taken history, an examination of catheterized urine and, if confusion still exists, cystoscopic examination. In appendiceal infection, a history will usually reveal the onset of a general abdominal pain, centering first around the navel and becoming more acute in the right iliac region. The temperature, too, in appendicitis is much more constant as a rule than in pyelitis, and chills are much less frequent.

Acute infection of the gall bladder frequently causes chills and an intermittent temperature, resembling that in pyelitis; but, in this condition, the spasm of muscles and tenderness are practically always confined to the upper right abdominal region. Acute pyelitis frequently accompanies pregnancy and the puerperium and, if only a chemical test is made of the urine, toxemia of pregnancy may be suspected. I also have no doubt that cases are frequently treated for puerperal sepsis when the real pathology is in the pelvis of the kidney. In any acute infection there is apt to be some pus and blood in the urine and, if this infection happens to be located in an abdominal organ, confusion will frequently exist.

The confusion between malarial infection and pyelitis is a plausible one and no case should be submitted to quinin therapy until a thorough investigation of the urine has been made. The differentiation of acute pyelitis from septic conditions of the kidney parenchyma in the early stages is very difficult. No suspected surgical kidney should be operated upon until drainage of the pelvis by a ureteral catheter has been tried.

Of greatest importance in the treatment of pyelitis is elimination both by the intestinal and the urinary route. The bowels should be kept open and a large amount of fluid given. If sufficient water is taken no drugs will be necessary to cause a bland urine. Urotropin has for a long time been the drug of choice but, in the light of recent experimentation, I believe that the results obtained have been because of the large intake of fluids.

Shohl and Deming (Jornal of Urology, October, 1920) have published experiments showing that about 60 to 75 per cent. of hexamethylendiamin given is excreted in the urine as such and that conversion into formaldehyd depends upon the acidity of the urine and the length of time excreted. Their experiments indicate that the urine must be retained in the bladder at least two hours in order for sufficient formaldehyd concentration to take place to be effective as an antiseptic. Then it would seem that it is entirely valueless at the kidney pelvis or in cases suffering with frequency of urination. If, however, the patient is able to retain the urine for a period of two hours, urotropin may be of value as a prophylactic in preventing vesical infection or in the treatment of such infection when it precedes the inflammation of the kidney pelvis.

Aynesworth (Surgery, Gynecology and Obstetrics, July, 1915) advocated the washing out of the renal pelvis with sterile water and injecting a solution of some silver salt. This procedure was carried out in four of our cases during the acute stage with very excellent results. Three of the patients were having intense pain with temperature over 102 at the time of treatment. They were in every instance immediately relieved of pain and the tmperature did not at any time after the treatment go above normal. Another patient had been having daily chills for about 10 days. Following a pelvic irrigation no more occurred for five days, and no more occurred at all after the second treatment. The technique employed was the passage of a soft ureteral catheter up to the renal pelvis and irrigation with boric acid solution until the fluid returned clear, then about five c.c. of two per cent silver nitrate

were run into the renal pelvis and permitted to drain out through the catheter. In three of these patients the catheter was withdrawn at the end of the treatment and the procedure was repeated in about a week. In one case there was so much swelling and edema and the inflammation was so pronounced that the catheter was left in place and the renal pelvis irrigated every four hours for 48 hours. A comparison of the result obtained in these cases and in those in which the cystoscopy was not done in the acute stage, shows a very marked difference, the cases that were cystoscoped convalescing much more rapidly. I believe that every case in which the intense pain and temperature persists for more than 48 hours should be drained in this way.

Two of our patients were treated by being given large amounts of alkali, keeping the urine alkaline, together with forced fluid. The results were very satisfactory. Colon vaccine was used in three cases but I was unable to see any benefit from its use. Mercurochrome was used in two cases but no special benefit could be attributed to it.

OPTIC NERVE IN ITS RELATION TO THE POSTERIOR NASAL SINUSES.*

By JAMES BORDLEY, M. D., Baltimore, Md.

In calling your attention to the optic nerve in its anatomic and pathologic relations to the para-nasal sinuses, I am not unmindful of the existence of the voluminous literature upon this subject. It occurred to me that a recitation of personal experiences might lend interest even to this oft told tale.

It is, indeed, an established fact that disease of the accessory nasal cavities is protective of alterations in the appearance and function of the optic nerve. If we call to mind the exposed position of the nose, exposed not only to physical violence but to atmospheric changes and germs of disease, and its intimate relationship with the optic nerve, we will find small cause for wonder. The nose is from birth subjected to severe infections and, due to its peculiar anatomical structure, it frequently undergoes histological changes of far-reaching importance. Most of the changes in microscopic structure within the sinuses arise from the intimate relationship of the mucous membrane and periosteum which are to all intents and purposes one and the same. A severe or long continued inflammation of this muco-periosteal covering is prone to seriously affect the underlying bone.

I am not assuming too much when I say that the nasal chambers and accessory cavities of most adults are the seats of definite pathological changes. So long as these changes affect neither health nor the integrity of adjacent organs they attract little attention. Unfortunately, however, the sinuses are in intimate relations with other structures vital to man's happiness and usefulness, such, for instance, as the optic nerve, which for about half its length lies in close proximity to the posterior cells; the vidian, or maxillary nerves, which pass through foramina in the sphenoid bone; the oculomotor, trochlear, abducent and ophthalmic, which usually pass through the sphenoidal foramen, but, as has been pointed out by Schaeffer, not infrequently through the body of the sphenoid bone itself. The sphenoid and posterior ethmoid sinuses are separated from the optic nerve only by the thickness of the wall of the optic canal which usually measures less than half a m.m. This bony partition is pierced by veins which, originating in the sinuses, empty into the central vein of the optic nerve—the vein of Vossius. The muco-periosteal lining of the sinuses is practically continuous with the duro-periosteal lining of the optic canal through vascular anastomoses. Not only is the intracanalicular position of the nerve exposed to the baneful influences of sinusitis but also the intracranial portion and the optic commissure. These latter structures lie on either the superior or posterior wall of the sphenoid sinus and at times are protected only by a lamina of bone of the thinness of paper. The disturbances which have been noted in the optic nerve have been variously ascribed to toxaemia, venous stasis and pressure. It seems probable that these three agencies play a part, sometimes one of them, sometimes all of them. In sinusitis we do not always deal with a suppurative process; indeed the most insidious form, the form which does the greatest damage to neighboring structures, is a hyperplastic inflammation. This chronic disease, with its osteophytic growths, its rarifying osteitis, and its tissue thinking propensity, may close the ostia of sinuses and pre-

*Read by invitation at the first meeting of the Virginia Society of Oto-Laryngology and Ophthalmology, in Richmond, February 3, 1921.

vent draining and ventilation; impinge on branches of sensitive or special nerves and involve their peripheral distribution.

One of the most disturbing factors in sinus disease is the general impression that all sinusitis must be productive of pus. This impression is a stumbling block in the way of adequate study of sinuses. It is commonly supposed that to discover the presence of sinusitis it is only necessary to casually inspect the nose. This is indeed an erroneous opinion for while the presence of disease in the para-nasal sinuses is sometimes extremely easy to determine, at others it presents problems which are only solved by careful, thoughtful and, I can almost say, prayerful study. To pass a final opinion as the result of one negative investigation is only inviting disaster for the patient and mortification for the physician. Indeed, I have come to look upon the diagnosis of sinus disease in many instances as an achievement. In many cases to depend solely upon intranasal inspection is folly—more frequently one would be misled than helped. Indeed, there are but three reliable indications of sinus disease to be elicited by intranasal inspection; pus, polypi and necrotic bone, and they are more frequently visually absent than present.

In doubtful cases, we must call to our aid transillumination—which is helpful only in the anterior cells—and suction—which makes manifest pus when the ostium of the sinus lies below the level of the pus. It is upon the radiograph we must largely depend. While this procedure offers exceptional advantages a single negative finding should not be considered as definite evidence of the non-existence of sinus disease. Its value is dependent not alone upon the clarity of the picture but upon the experience of the one who translates that picture. Only the other day, I saw a child on whom had been performed a radical antrum operation in consequence of the radiographer mistaking an occipital ridge for pus in the antrum. This child had choked disks the result of a cerebellar tumor.

It is essential for the reader to have a clear mental picture of the anatomic variations in size and position of the sinuses. A distinguished radiographer told me that he would never give a final negative opinion on any sinus without first viewing it from at least six different positions. You see then that even in the hands of a man of superior experience there are real difficulties to be overcome and I use the experience of my radiographic friend to again illustrate the point that a negative finding of any single method of examination is not proof of the absence of sinus disease.

I have gone fully into the discussion of the anatomy, the pathology, and diagnosis of this question, because I believe it will serve to emphasize the importance of thorough, painstaking investigations before concluding that a given disturbance in the function of the optic nerve is or is not based upon disease of the paranasal cells. I have endeavored to make it clear that there is a real anatomic and pathologic basis for the assumption that disease of the sinuses may be made manifest by changes in the ophthalmoscopic and visual field pictures of the optic nerve. As the most peripheral fibers of the optic nerve, as it traverses the optic foramen, are the paripapillary fibers of the retina, it follows that involvement of the duro-periosteal lining of the optic canal in the disease of the underlying sinus will inevitably lead first to damage of these peripheral fibers. If the resulting swelling of the lining of the canal is evanescent and not intense, involvement of the deeper portions of the nerve will probably not take place: if, however, it is severe and long continued, it may lead to symptoms which vary from slight obscuration of vision to total blindness. Pressure from a swollen lining may affect the nerve through mechanical damage by obstructing its circulation, by the production of local toxaemia, and through transmission of toxins by contact. It is to the potency of these various etiologic factors that we must look for an explanation of the alterations in the fields of vision.

The most common of these alterations is an enlargement of the blind spot of Marriott. This enlargement is of spindle form, which gradually overspreads a preceding and advancing color scotoma and is dependent upon inhibition of the function of the most peripheral of the fibers of the optic nerve. In 102 patients with sinus disease we found this symptom but 31 times. I am convinced that in the remaining cases we were dealing with individuals with abnormally thick sinus walls, with abnormal circulatory conditions, or in whom there had taken place some inexplainable compensatory change in the optic canal.

While of less frequent occurrence than enlargement of the blind spot, other para-central and central scotomata are more interesting and, from a visual standpoint, more important. The intensity of central change varies from a mere disturbance in red and green perception to a positive scotoma for colors and white extending beyond the normal blind spot. While some authors have attempted to differentiate this scotoma from similar changes due to other causes, I have found but two significant facts: In sinus disease, the alteration is usually unilateral and more rapid and definite in its formation. There are, however, many exceptions to this rule.

We are still in doubt as to the direct causative factor in central blindness. Birch-Hirschfeld looks upon it as a result of toxaemia resulting from venous stasis within the optic canal; Hajek described it as a sign of perineuritis from pressure; and Gradle attributes it to disease extension through soft tissues and vessels from the infected sinuses. In the eleven cases that I have observed, it appeared only as a symptom of chronic sinusitis; in but four of these patients was it associated with enlargement of the blind spot. This experience leads me to suspect that central visual alterations probably result from toxaemic disturbances in the central bundle of the nerve, sometimes associated with pressure in the canal, but usually not.

Disturbance in color perception and peripheral contractions which are frequently seen are so influenced by pain, fatigue and alterations in illumination as to make them of questionable diagnostic value. Where both optic nerves are disturbed, either partially or in their entirety, the lesion usually lies without the cranial cavity and the part most frequently affected is the optic commission.

The association of sinus disease with ophthalmoscopic lesions is so clearly stated by de Schweinitz that I quote him: "It is well known that sinusitis may be associated with ophthalmoscopic lesions, such as optic neuritis, retrobulbar neuritis and thrombosis of the retinal vessels. It may manifest itself as an ordinary oedema of the nerve head or as an inflammatory optic neuritis. In a certain number the manifestation is that of a retrobulbar neuritis with its well known symptom of obscuration of vision progressing to complete or almost complete blindness, with at first negative ophthalmoscopic findings."

My experience leads me to believe that the most usual picture found is that of dimness or haziness of the margins of the disk. While many theories have been advanced to explain this phenomenon. there is but one that appeals to me—venous stasis. Through the orbital veins there is a direct communication between the veins of the sinuses and the cilioretinal system. These veins are valveless and congestion or stasis in one would almost certainly affect the other. Haziness of the disk margins is by no means pathognomonic of sinus disease. Indeed, any cause which has a depressing effect on the orbital circulation may result in obscuration of the margins of the disk. Therefore, considered by itself, while it is a straw that points the wind, it is not definite diagnostic evidence.

The ophthalmoscopic change may pass beyond the simple congestion just mentioned and manifest itself as a pure neuritis, a retro-bulbar neuritis or a choked disk. In my cases, inflammatory neuritis was more frequently met with in patients in early adult life and in association with moderately acute nasal symptoms; retro-bulbar neuritis with its typical ophthalmoscopic picture occurred in the more chronic types of sinusitis; and I have come to regard choked disk as an indication of secondary meningeal disturbance. I have seen but four patients with choked disk, and, in three postmortems obtained, evidence of the extension of the disease to the meninges was present. I have no doubt a sort of benign choked disk can result from an increase in intracranial pressure brought about by non-purulent reactions in the cavernous sinus or the meninges just as transitory choking of the disk develops as the result of inflammatory disturbances in the mastoid and middle ear.

There are certain ocular manifestations without the optic nerve which are helpful in determining the existence of sinus disease. I refer particularly to orbital neuralgia; fugitive oedema of the eyelids; congestion of the conjunctiva with the familiar "wet eye"; recurring attacks of episcleritis; and paralysis of one or more of the ocular muscles. Like all other ocular symptoms of sinus disease, none of these conditions is constant and none is peculiar to sinus disease.

This fact calls to my mind the thought that in dealing with disturbances in the optic nerve we should be most conservative. By conservatism, I do not mean fear to follow a bold course when action is demanded, but rather action based upon careful, painstaking investigations. If we are to judge by published statements, inoffensive sinuses are frequently obliterated before a careful diagnostic routine has eliminated other possible causes of disturbance in vision. Unfortunately, we know no ocular manifestation peculiar to sinusitis, nor do the coincident presence of the two necessarily justify the assumption that the one is dependent upon the other. Optic nerve disease is not only a serious menace to sight, but it is only too frequently an early manifestation of serious constitutional disease. It behooves us, therefore, before attempting intranasal operative treatment, to make sure that we have neglected no essential detail in diagnosis. Sinus operations are not free from danger either to sight or life. It is, therefore, incumbent upon us, before undertaking such procedures, to fortify ourselves in advance, by submitting our evidence and the patient for the impartial examination of a competent internist or neurologist.

SURGICAL PROCEDURES IN FRACTURES OF THE ELBOW.*

By JAMES G. OMELVENA, M. D., U. S. Navy.

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A brief review of the anatomy of the elbow is advisable. This joint is formed by three bones: the humerus, the ulna, and the radius.

For our consideration the end of the humerus presents two articular surfaces: the capitellum and trochlea; the capitellum, a rounded eminence for articulation with the radius: the trochlea, a deep smooth groove for the ulnar articulation. In addition, the olecranon fossa posteriorly, and the lateral and medial-epicondyles must be borne in mind. The medial epicondyle is the larger and more prominent.

There is a separate center of ossification for each epicondyle, the trochlea and the capitellum. These centers unite to the body of the bone between the sixteenth and eighteenth years, the medial epicondyle being the last to join.

The upper extremity of the ulna has the large olecranon process, the coronoid process, the semilunar notch for articulation with the trochlea of the humerus and the radial notch for articulation with the head of the radius. A separate center of ossification in the olecranon process joins the rest of the ulna about the sixteenth year.

The upper extremity of the radius presents a head for articulation with the radius notch of the ulna and capitellum of the humerus; a neck, and the radial tuberosity. A separate center of ossification in the head fuses with the body about the seventeenth year. An additional center is occasionally found in the radial tuberosity.

The articulation between the ulna and humerus is a hinge joint; the radius and humerus form a ball and socket joint; and the ulna and radius form a pivot joint. The joint capsule covers all three articulations. Thickened portions in the capsule form the so-called joint ligaments.

The anterior and posterior ligaments are thin and broad, being very little more than membranous. The radial collateral ligament is a short fibrous band extending from the lateral epicondyle to the annular ligament of the radius. The ulnar collateral ligament is a thick triangular band attached by its apex to the medial epicondyle and inserted below into the coronoid process and olecranon. The annular ligament forms a strong fibrous ring holding the head of the radius to the ulna. A prolongation down to the neck of the radius is called the quadrate ligament.

The synovial membrane forms a sac extending into all three joints. A large bursa over the olecranon, a bursa under the biceps tendons, and one under the triceps tendons at their insertions are sometimes of importance surgically.

The muscles related to the joint are brachialis and biceps in front, triceps behind, supinator and extensors on the outside, pronator and flexors on the inside.

A very complete network of anastomosing branches of bloodvessels is formed about the joint.

The nerve supply is from the ulnar, musculocutaneous and median.

Most fractures in the region of the elbow are easily diagnosed; many are very difficult

*Read before the Surgical Section of the Norfolk County Medical Society.

to diagnose, and some are extremely deceptive. As rational treatment depends on accuracy of diagnosis, the doubtful cases should be carefully examined while the patient is anaesthetized. Three bony points should be recognized and marked. They are the olecranon, the internal and the external epicondyles. With the forearm extended, they form a straight line. When the forearm is flexed they form a triangle. These three points can be identified even in the presence of considerable swelling. The head of the radius can generally be located. The carrying angle of the two arms should be compared. Crepitus, false motion, limitation of motion, localized or general, swelling and ecchymosis, with a careful consideration of the history of the injury and age of the patient, will generally point to the nature of the fracture. X-ray plates should be taken of all cases.

The varieties to be borne in mind which involve the humerous are; transverse fracture just above the joint, one or both condyles through the olecranon fossa, the T- or Y-fracture, one or the other epicondyle, fracture of trochlea or capitellum, and epiphyseal separations.

The varieties involving the ulna and radius are: Fracture of olecranon, coronoid process, head and neck of radius.

Any of these fractures may be compound, comminuted, complicated with dislocations, damage to nerves, bloodvessels, and other soft parts, and followed by infection.

The transverse fracture just above the joint is generally the result of a blow on the elbow. The lower fragment is usually displaced backward and upward by the triceps, biceps and brachialis. The normal bony prominences at the elbow joint are in correct relation. The carrying angle may be lost. The joint of the elbow is very prominent. Lateral movement and crepitus can be found. Lateral and anteroposterior x-ray plates are sometimes necessary and always useful.

The treatment of this transverse fracture is early reduction under ether. To maintain this reduction, fixation in acute flexion is generally the most satisfactory position. It opposes the posterior displacement of the lower fragment. In some cases with much swelling or anterior displacement, a right angled anterior splint will be preferable. After reduction and fixation, an x-ray should be taken to insure a good result. Some form of traction applied to forearm is often necessary.

Fracture of both condyles takes place through the olecranon fossa. This may not involve the joint cavity. If the fracture is continued down between the condyles to form the so-called T- and Y-fracture, the joint is always involved. Displacements of the relations of the bony prominences then take place. Crepitus, swelling and tenderness will be more marked over the condyle injured if only one is involved. Transverse measurements are increased and the carrying angle increased or decreased. Lateral motion of the elbow is often present.

Acute flexion will hold most of these fractures in reduction. Some, however, do better with a right angled anterior splint and some few cases will yield the best results dressed in extension. In some cases, open treatment must be resorted to, and fragments replaced, pegged or fastened with absorbable material.

Epiphyseal separations composed of the trochlea, or capitellum, or both, or the medial epicondyle, are often difficult to diagnose without the x-ray. Fortunately, there is usually very little or no displacement. When there is, open operation may be necessary.

Fracture of the olecranon process is frequently overlooked. It is easily diagnosed because of the subcutaneous position of the bone. Reduction should be maintained with the forearm extended. On account of the danger of fibrous union, operative treatment is often advisable.

Fractures of the coronoid process of the ulna and the head and neck of the radius are more difficult to diagnose, the x-ray being very valuable in doubtful cases. Flexion of the forearm relieves the pull of the biceps and brachialis muscles. Acute flexion is the posiiton indicated to maintain reduction of these fractures.

Just a word as to the technic of maintaining reduction by the acutely flexed position. With the x-ray plates before one and the patient anaesthetized, the patient's arm is grasped at the seat of fracture with one hand, the forearm is grasped close to the elbow with the other hand, an assistant giving needed traction to the forearm. When fragments seem to be normally approximated by manipulation, the forearm is acutely flexed on the arm and retained

by a wide strip of adhesive stretching across from just above the wrist to just below the axilla. A wide binder is applied to hold the arm to the chest wall. A smooth pad should be previously placed in the bend of the elbow and the arm, forearm and hand protected from the chest wall by suitably placed pads. The pulse at the wrist and the amount of swelling determine the acuteness of the flexion.

An x-ray should then be taken to be sure that reduction is maintained. The flexion can be increased as the swelling subsides. In ten days' time, dressings are removed, the skin cleansed and powdered, and the dressings replaced. One of the chief dangers of elbow injuries is the loss of flexion.. Dressing the arm in extreme flexion avoids this.

The after-treatment of most fractures involving the elbow consists in early institution of passive motion and massage, and the careful maintenance of reduction for four to six weeks; then active and passive motion to recover all functions of the joint. Some cases must be reset several times, errors on the part of the surgeon, but most often on the part of the patient, causing mal-positions to recur or persist.

Operations with suture or pegging of fragments, or bone grafting or clearing of the joint cavity of displaced fragments or soft parts, or resection of the joint, will be necessary at times.

Frequent x-ray plates are desirable and almost a necessity. Before and after reduction and during convalescence, the surgeon should keep in touch with the bony parts by means of skiagrams.

Dislocations at the elbow joint may be of the ulna or radius alone or both together. The bones may be dislocated forward or backward, laterally or medially. Both bones backward is the most frequent. Often fracture complicates the dislocation.

Diagnosis rests on displacement of bony landmarks, lack of crepitus, and x-ray plates.

Treatment, of course, is early reduction. Anaesthesia is often necessary and open operation occasionally necessary.

I have a case to report in connection with this subject. The injury was sustained in a wrestling match, a fall on the left elbow producing a lateral dislocation of both the ulna and radius with fracture of the medial epicondyle. The fragment of epicondyle was dragged into the cavity by the strong ulnar collateral ligament, became lodged in the saddle shaped trochlea and reduction was impossible, even under ether. A roughened internal condyle was detected on palpation even in the presence of considerable swelling. The x-ray plates cleared up the nature of the obstruction and also the place from which it had come.

It was the type of case that in private practice, without x-ray plates, could so easily run along for months into a suit for malpractice.

One attempt under ether was made to dislodge the fragment of epicondyle from the joint surface but was entirely unsuccessful. Operation was then decided on and performed by Dr. Munger who does most of our bone surgery. The joint was easily exposed by a curved incision anterior to the internal condyle. The fragment was found and was with difficulty dislodged from the trochlear notch. The strong ulnar collateral ligament was still attached. The reduction of the dislocation was then very simple. The epicondylar fragment was the collateral ligament at the base of the epicondyle and then through a hole drilled in the internal condyle. The skin was then drawn across and sutured, the suture line being anterior to the epicondylar prominence. The forearm was then put in extension to get an even pull on the fragment. The ulnar nerve, which lies just posterior to the medial epicondyle, was injured at the time of the fall. Those same injuries were present after the operation, but were not attributed to the operation.

SOME POINTS WELL TO CONSIDER IN THE PRELIMINARY AND POST-OPERATIVE TREATMENT OF PROSTATE CASES.*

By ARTHUR S. BRINKLEY, M. D., Richmond, Va.

During the past ten years, the mortality rate for the removal of the prostate gland has been markedly decreased and this is due largely to investigation of the patient's condition with subsequent proper preliminary preparation, selection of cases, and post-operative treatment, rather than to the improvement in operative technique. Do not understand me to discount the operative technique, for I do think it is all important, but my experience has been that the large majority of fatalities in these

*Read at a meeting of the Richmond Surgical Society, October 5, 1920.

old men have been due to neglect in observing the foregoing important factors.

I well remember how these patients were treated eight or nine years ago; usually they came in the hospital one day and were operated on the next, and about 40 to 50% of them died within seventy-two hours. Since that time, it has been very gratifying to observe the improvement in the methods of handling these cases and the resultant decrease in mortality rate.

The age of the patient, general physical condition, and duration of trouble should be the first things to take into consideration. Of course, an early case in a patient, say fifty-five to sixty, other things being equal, would be a better risk than one ten years older with a history of trouble for some time; also does this hold good in regard to general physical condition. A man who has been in robust health would naturally be considered better prepared for the operation than one who has not. The duration of the disease gives one important bearing on what to expect of the kidney function for instance. With a history of trouble for only a few months, little if any residual urine should be found and, consequently, a marked impairment to kidney function, due to back pressure from a large quantity of residual urine, would not be expected.

All cases of residual urine, resulting from hypertrophy of the prostate, should be properly classified. In early cases we expect from a very little to two ounces; in moderately advanced cases two to four ounces; in advanced cases four to six ounces; and late cases over six. On this classification, together with the amount of pus found in the urine, treatment for preliminary drainage should be based. In early cases, only occasional catheterization is necessary; in moderately advanced cases, a retention catheter; and in advanced and late cases, supra-pubic cystostomy should be done. We used to irrigate these cases several times a day but do not do it very much any more, only in cases of much pus, and then with mild antiseptic like boric acid solution, 1 to 2%. If a large amount of pus is present, say 4 plus (over 100 cells to field), we should suspect diverticulum of bladder complicating the trouble. Formerly, vaccines were used a great deal in cases showing much pus in the urine, but we believe the majority of surgeons have about abandoned their use, since results did not justify the amount of discomfort it gave the patient.

Kidney function is the most important factor to consider in preparing a patient for operation; under this head we will consider specific gravity, functional kidney test (phenolsulphonephthalein), and blood urea nitrogen. Low specific gravity has been an indication for postponing operation for several years and I still believe it should be given due consideration: I do not think a patient should be operated if the specific gravity is under 1012. For the past few years, the phenolsulphonephthalein test has been relied on almost exclusively to show the renal function, but this test alone has been discredited by several recently and I have found it inaccurate myself in a few cases. It is claimed, when there is much irritation to the renal epithelium, this test will be quite high, while the actual damage to the kidney may be marked, so it seems advisable from the facts in hand not to rely on this one test exclusively but rather to check it up with specific gravity and blood urea nitrogen.

I believe the last named test is the most accurate of the newer methods yet contributed for the study of renal function. There is a very good editorial, in the *Journal of A. M. A.*, Sept. 18, 1920, concerning MacNider's recent investigations on renal function, the last paragraph of which I quote: "It is worthy of note by those who are accustomed to rely on old-time urinary diagnostic tests that, according to MacNider's accurate estimates, the amount of protein in the urine is no index of the severity of the pathologic condition of the kidney or the degree of functional disturbance. He states that the quantitative output of protein may show a progressive decrease, easily mistaken for recovery, while at the same time the capacity for elimination of phenolsulphonephthalein is rapidly decreasing, and both urea and creatinin are showing a retention in the blood."

According to some notes I took from a lecture given by Braasch at the Mayo Clinic, recently, an early case showing a functional test of 40 or over with little or no residual urine and blood urea nitrogen 40, is in shape for operation, but, personally, I would rather wait for the blood urea nitrogen to come down to 30 or under before operation, even in healthy

early cases. In moderately advanced, advanced, and late cases, one should never operate unless the kidney function is 35 or over and the blood urea nitrogen is 30 or under, and specific gravity at least 1012.

In cases showing much pus in the urine and in which we suspect diverticulum or stone, history of cord lesion or hematuria, a cystoscopic examination is advised; in other cases I do not think it should be used, for the traumatism inflicted may give the patient a severe urethral chill or start up a serious infection and nothing of interest is accomplished by the procedure which could not have been obtained by other examinations fraught with less danger.

In preparing these old men for operation, my experience is that they do better on a bland mixed diet with milk and when allowed up and about, even with retention catheter or supra-pubic drainage, than they do in bed on a milk diet. Milk alone seems to be too much of a one-sided diet and there is nothing more disastrous to an old man than to put him to bed for any length of time.

In the post-operative treatment, the most important thing is a minimum loss of blood. It is surprising to know how little blood these old men can lose and it should never be more than a few c.c. Loss of blood markedly lowers the resistance of the patient to infection and also may cause a sudden drop in blood pressure with fatal results, before it can be corrected by artificial means. Bleeding should be controlled by ligation, a gauze pack, or hemostatic bags. On a recent visit to the Mayo Clinic, I was at first struck by the unusually large incision made for supra-pubic prostatectomy, but found this was done to give a good exposure of the capsule after the gland had been removed, in order to ligate the larger bleeding vessels and whip over the capsule to control any general oozing. It was remarkable to see how little bleeding these patients had after such treatment and a large incision in the bladder seems to heal as quickly as a small one if properly sutured.

A few years ago, irrigation following operation was very much the custom, but we are getting away from that more and more. Do not irrigate for several days after the operation, then use mild antiseptic, like 1 or 2% boric acid solution, once or twice daily.

Feeding should be started just as soon as the patient's stomach will tolerate it—full liquid diet twenty-four to forty-eight hours after operation, and bland soft diet with milk on the third or fourth day.

The large rubber tube is left in the bladder five or six days. If the patient is doing well, replace this by a smaller one, which is kept in for three days; replace this by a still smaller one: remove in three days.

Epididymitis is a complication which is very annoying at times; this should be controlled by an ice bag or hot packs. If this is not satisfactory, make an incision and drain.

Suppuration in wound is best treated with hot packs of saturated solution of boric acid or 1 to 5000 potassium-permanganate solution.

Cases showing signs of uremia should be thoroughly filled with fluids, eliminative organs opened up by active catharsis, and hot packs used for twenty minutes every four to six hours.

Pyelo-nephritis is often a very serious complication; if it comes on immediately after operation, nearly always fatal; if a week or ten days after, not so serious. These patients should be given renal stimulants and supportive treatment as indicated, plenty of distilled water, and a restricted nephritic diet.

Sounds should never be passed until three weeks after operation; by this time the wound is healed. If done before that, one is very liable to get marked infection which means a serious complication.

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11 West Grace Street.

ASSOCIATED NERVOUS MANIFESTATIONS AND PSYCHOSES IN OBSTETRICS.*

By JOSEPH BEAR, M. D., Richmond, Va.
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Before going into the special details concerning the various nervous manifestations associated with this department, it may be prudent to mention briefly several changes in the nervous system due to pregnancy, and a-

*Read before the Richmond Academy of Medicine and Surgery on March 22, 1921.

word or two regarding the mental hygiene. It must be well borne in mind that an existing pregnancy with its allied conditions—parturition and lactation—calls forth an extra demand of energy from every cell, from every tissue and from every organ within the body. It diminishes the woman's vitality, debilitates her entire organism and brings about a physiological commotion in the nervous apparatus. This, in turn, brings to bear a strain upon her which is, even under normal conditions, attended by emotional irritability, depression and other reflexes. Pregnant women are more impressionable, subject to varying moods, are hyperexcitable, and sometimes a change in their character occurs, a quiet, sweet-tempered person becoming irritable, ill-tempered, low-spirited, and even hysterical, or vice versa. A tendency to melancholia occasionally develops and real psychoses are not uncommon, especially if there is a family taint. These symptoms may be the outcome of a toxemia, which pregnancy greatly invites. In the early months there is a tendency to sleep, especially after meals. Pregnant women frequently complain of a sort of fainting spell. It is accompanied by palpitation or fluttering of the heart, sometimes with pallor, and occasionally by slight loss of consciousness, resembling petit mal. The symptom, though annoying, is not dangerous, unless due to organic cardiac disease.

The condition of pregnancy, although within a physiological borderline, frequently invites nervous manifestations in varying degree. The mental state of the expectant mother should be preserved as far as possible in a happy, quiet atmosphere, filled with contentment, for it is generally known that sudden emotions, producing profound shock, are detrimental to the maternal organism and may, in turn, cause an interruption in pregnancy. She should be protected from all horrible, tragic, unpleasant and gruesome sights, from the hearing of accounts of disasters of all kinds, murders with what the press calls shocking details, and railway accidents with realistic descriptions. These are not points of theory, but facts which can be truly applied to actual cases. Entering superficially on the phase of maternal impressions, it may be said, in passing, that women with psychopathic tendencies, who are led to believe in these impressions, may in some instances develop an anxiety psychosis marked by anxiety, restlessness and depression.

The processes of pregnancy make a deep impression on the woman's entire nervous system and more especially on her mental functions. This is especially true in the case of primiparae. The fact is easily understood, for a woman is filled with expectation and anxiety concerning the unknown event, the complete revolution in her organization, the formation of a new being within her uterus. Many reflexes are apt to occur. How many joyful hopes, how many distressing fears, are connected with that which is about to take place, with the act of creation within her bosom; what changeful glimpses into the future, on the one hand the gladness, on the other the terror of motherhood; often, also, the anxious doubts as to the probable sex of the newcomer. Consider, too, the stormy sensations experienced by a woman, who, unmarried, has become pregnant contrary to her desires and expectations, especially one in a poverty-stricken condition. Consider the agonizing thoughts in such a case regarding the consequences of giving birth to a child. In these cases there is nearly always a lack of prenatal care, associated, more or less, with various nervous manifestations, fears and the like and, in addition, a marked predisposition to the toxemias of pregnancy. It is only to be expected that in pregnant women in general there will almost always be increased irritability of the nervous system combined with a tendency to a rapid variation of emotional states. Neumann found in almost all the pregnant women whom he examined that there was an increase of knee-jerks, as a manifestation of the general increase of nervous tension. Nor does this change depend upon mental influences exclusively; there are other factors, such as the reflex processes aroused by the enlargement of the uterus.

The pathological consequences of pregnancy, as far as they affect the nervous system, take the form of neuralgia and of peripheral neuritis of various nerves, of chorea, of disturbances of the sense organs, and of actual psychoses. As is generally the case, these neuralgias have as a starting point some portion of the nervous system in which a pathological condition is present. The decay of teeth, so often observed during pregnancy, accounts for many of the

cases of obstinate toothache that annoy and distress these patients. In women who suffer from habitual constipation during pregnancy and in whom the size of the fetus is so great as to cause pressure upon the nerve trunks at the brim of the pelvis, obstinate cramp and sciatic pain may occasion great distress and may seriously affect the patient's general health. Some of the most severe of these cases result from the pressure of hardened fecal matter upon nerve trunks above the brim of the pelvis, and upon branches of nerves so situated that they may be pressed upon in the pelvic cavity. In some of these cases, the uterus will be found retroverted, thus preventing proper evacuation of the bowels and adding to the pressure that retained fecal matter excites. In other cases, the patients complain of cramp and of sudden spasmodic contraction of the thigh muscles, often becoming worse at night. When the disorder is severe, obstinate pain, radiating down the thigh as far as the knee or even below the knee, is often observed.

Pregnancy favors the occurrence of chorea, due, of course, to the increased irritability of certain nerve centers characteristic of the pregnant woman. This condition usually occurs in primiparae: it is commoner in young than in older pregnant women and seems to make its appearance in the early stages of gestation. In the large percentage of cases it usually disappears before the end of term. If patient grows steadily worse, the induction of premature delivery is sometimes followed by excellent results.

Hysteria does not seem to have a marked influence on the course of pregnancy. On the other hand, the hysterical symptoms may flare up and attacks become more frequent and the other nervous disturbances associated with hysteria become more pronounced.

The influence of pregnancy in epileptics is likewise variable. Attacks of epilepsy may occur in girls hereditarily predisposed when they reach the age of puberty and reoccur at each successive menstrual period. When such patients marry and give birth, their children show a marked neuropathic and psychopathic tendency. Another condition which may be closely associated with pregnancy and fortunately of rare occurrence is tetany. Especially in women, it occurs almost exclusively during pregnancy and the puerperal state. The tetany of pregnancy usually runs a favorable course.

Even in the normal course of gestation, one of the usual concomitant features associated with it, namely the morning sickness, often causes great annoyance and distress. If this condition becomes aggravated, it may eventuate into a pernicious type and seriously affect the general health of the patient and finally necessitate the evacuation of the uterus. Fortunately, only about one-third, or 33 1/3%, of women are troubled with this reflex vomiting. The real cause is not definitely known; it may be toxic in origin. Primiparae are oftener affected than multiparae. It occurs oftener in the upper classes of society and in those with a neurotic tendency. Along with this, the slighter forms of mental disorder consist of perversions of taste and smell.

Of actual psychoses occurring during pregnancy, the commonest forms are melancholia and mania. The former condition which, according to Ripping, occurs in 84.4% of the cases, is usually very severe and is characterized by a peculiar dreamy condition; it often leads to suicide, or to infanticide immediately after delivery. The psychoses of pregnancy are seen with greater frequency in the second half of gestation: they occur especially in primiparae and are also commoner in unmarried women. The outcome, as a rule, is unfavorable: sometimes the mental disorder ends with the pregnancy, but in other cases it passes on into the puerperium lasting from six weeks to six months. These psychoses are usually toxic. In women whose nervous systems do not stand the strain of pregnancy well, there will be noted a disordered metabolism. In each case a careful history of the patient should be obtained from some reliable member of the family and also other points relating to the family traits. It has been noted that in these psychoses, hereditary influence plays an important role in about 50% of the cases. In certain neurotic women the existing pregnancy may produce a degree of fright that borders close upon mania.

Psychoses of Parturition.—Even during labor, acute insanity is sometimes observed in women who are hereditarily predisposed, when the pain is very severe. Ordinarily, the mental condition of the patient during the first stage does not differ from that of a woman suffering pain. In neuropathic subjects it may be

marked by hysterical manifestations. In the second stage, towards the end, she may become delirious or even maniacal from the suffering, but, fortunately, this is rare. In a certain number of cases the woman's behavior, instead of being cheerful, may be the opposite, the patient stating that she is unable to bear the pain or that she will surely die. Severe cramps in the legs frequently add to the suffering.

Even during labor, one of the most dangerous complications that may befall the pregnant woman is convulsions attended by coma. This we call eclampsia. During the seizures various nervous phenomena are brought to the surface, the characteristic picture being quite familiar to us all. Between the attacks the patient may be quiet or restless, and sometimes she may become uncontrollable with wild and exhaustive delirium. Frequently these patients have no recollection of what happened. The woman may even deny her child when presented to her. This forgetfulness may extend as far back as a week before the actual attacks began, and occasionally there is a general weakness of mentality for several months following delivery.

The puerperium may likewise be invaded by psychoses of melancholia and mania. In patients who are in a weakened state, exhaustion psychoses may occur after prolonged and difficult labors. In cases of generally contracted pelves, or prolonged labor, pressure-paralysis may occur from the pressure exerted by the child's head upon the intra-pelvic nerves and, above all, on the great sciatic nerve; pressure-paralysis may also result from obstetrical operations, and especially from forceps delivery. The symptoms of pressure-paralysis consist chiefly of paralysis of the extensors of the feet and toes. Puerperal insanity is much more common than the insanity of pregnancy. Years ago it was quite a common complication but, since the standard of asepsis has been raised, there seems to have been quite a considerable drop. The first two weeks following delivery seem to be the time for its appearance. After this time it is commonly spoken of as "lactational insanity." Puerperal psychosis does not always have as its cause an infection; it may also be due to an auto-toxemia or directly to an unstable nervous system. However, infection is, by far, the most important point in the etiology. In these psychoses, the patients are, during the first few days, under great excitement, associated with hallucinations. Later, the maniacal symptoms disappear and the patient passes into a state of depression and frequently shows tendencies towards suicide. Puerperal psychoses are not uncommon as a sequel to those cases of eclampsia having had many convulsions, but they usually offer a fairly good prognosis, the majority of the patients recovering within a few weeks. Those following infection are very difficult and resist treatment; from 20 to 40% of the women fail to obtain their normal mental condition. From 5 to 10% of these patients with puerperal insanity die, this being chiefly due to the infection rather than from the mental condition.

In patients who subsequently become pregnant there may be, and frequently there is, a reproduction of the mental picture. Each succeeding attack leaves its mark and the patient should be fully warned not to become pregnant.

Summararizing.—The writer wishes to state that there is no form of psychosis peculiar per se to the child-bearing period but when it does occur, it assumes the clinical type in one or more of the recognized forms. In regard to the frequency of its development, by far the most frequent period is the puerperium (about 57%); 20% during pregnancy; during lactation about 17%, and from 4 to 6% during active labor.

Fortunately, the great majority of pregnant cases pass through the various stages untouched by the profound nervous manifestations and actual psychoses but, nevertheless, we must not lose sight of the fact that, the higher we ascend in the scales of civilization, the more complex the tissues become and the more they are rendered susceptible to the various nerve impulses. Civilization with its artificial dress and customs has rendered woman a lessened power of resistance; during pregnancy the whole metabolism is changed to meet the new demands on the system and it has been well said that "Gestation tests the integrity of every structure of the body." If there is any latent disease, nervous or otherwise, in the woman, pregnancy will bring it to the surface. This fact warns the accoucheur to study well the constitution of his patient and to observe carefully all weak points in the organism; to guard her from the disorders and complications of pregnancy, and from the dangers of excessive and too prolonged suffering.

216 East Franklin Street.

THE EFFECTS OF RADIUM AND X-RAY ON CANCER; ESPECIALLY SKIN LESIONS OF THE DISEASE.*

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I read my first paper on the advantage and necessity of measuring the dose of x-ray with the pastille in the treatment of cancer in 1912. The pastille still retains its position as a most efficient measuring device. X-ray machines and tubes have been enormously improved in the past few years until today doses of ray are given that were not dreamed of a few months ago.

The tendency for treatment machines is towards longer spark gaps and increased voltage, an improvement I have advocated for years. My present outfit, the one I have used for four years, consists of a 16 inch coil which delivers 50,000 more volts than the Coolidge tube will stand. In order to meet the capacity of this coil, I am ordering a modified Coolidge tube from Europe. With such an instrument, I should be able to deliver 30 to 40% of an erythematous or knockout dose to a cancer situated 10 centimeters below the surface of the body.

Intensive study of the biology of cancer cells has demonstrated that radiated cancer cells will not grow on transplantations and that three-quarters of an erythematous or skin dose of ray will inhibit mitotic figures in these cells and that 85 to 90% of an erythematous dose will destroy cancer cells, no matter if they be in a skin lesion, uterus or breast.

If a carcinoma can be brought under the influence of this amount of x-ray (which is possible by cross-firing), resolution of the tumor will almost certainly result.

This amount of ray still leaves a margin of safety for the bladder, intestines and rectum.

The use of thick filters of aluminum and copper has advanced to the point of producing what we call homogeneous radiation which cannot be altered by adding more filters.

As this technique comes into more general use, the tendency is to rely on the x-ray rather than the enormous amount of radium that would be required to equal it. It is known that no other than a very wealthy or well endowed institution could afford enough radium to obviate the necessity of such enormous quantities of x-ray.

These facts seem enough to warrant the belief that with still further improvements of the x-ray, which one can safely anticipate, the individual purchase of very large quantities of radium is hardly called for.

Because of the location of much malignancy in cavities as the uterus or throat, radium in quantities of 50 to 200 mg. will always be valuable and popular, but even then massive doses of x-ray will tremendously improve the chances of the patient and lessen the time of application.

If there are the slightest signs or expectations of metastasis, it would be the height of folly to rely solely on radium to the exclusion of surgery, fulguration and massive doses of x-ray.

In the treatment of skin cancer, which most frequently means basal cell carcinoma, the process is enormously simplified. Here the lesion is on the surface, easy to approach and we know the quantity and quality of ray that will kill every cell in the tumor. Why give three to one dozen treatments to get a result? We do not, and a majority of my patients, close to 100 per cent, remain cured after one massive filtered dose of ray. The same I do almost daily with a 30 mg. double strength radium applicator. This is not at all unusual. Even with the older technique and fractional doses of roentgen ray, Pusey, as early as 1907, reported 76% of cures in a series of 111 cases that included squamous and prickle-cell carcinomas; Dochter 91%; E. G. Williams 95%; McKee, in 1919 with the new technique, reported 98%. I seriously doubt if any of these prominent dermatologists today allow a single case of cancer confined to the skin to go uncured. These high percentages mean more than the bare figures indicate. One extremely important and significant point that I must lay stress on is this: these physicians are skillful dermatologists, trained in their specialty to recognize clinically the change from a benign to a malignant lesion. Not only is the dermatologist taught to know, fear, and destroy precancerous lesions wherever they are found, but he learns to carefully scrutinize and study these lesions for which many might

*Read as part of a Symposium on Cancer before the Medical Society of the District of Columbia, in Washington, February 15, 1921.

consider minor and unimportant objective symptoms.

A tiny blood crust, a very slight hidden and obscure ulceration under an old crust of months' duration, a very slightly elevated waxy border on one edge of the lesion mean this to a dermatologist. It means that he is no longer dealing with a wart, mole, or other precancerous lesion, but is face to face with a true skin cancer. Half of the battle lies in the diagnosis, as you see.

Probably the most complete statistics on skin cancer are those published by McKee in 1919. Precancerous lesions were not considered in his series of 222 cases and 201 cures. Eliminating a number of cases that had received previous fractional doses of ray, or were hopeless from the beginning, his results show 98% cures. Every case was a malignant carcinoma, many several inches in diameter.

Of the cases that relapsed, 75% occurred during the first year. His statistics show that 19 of the 24 relapses were again treated with x-ray and that 17 recovered. The two cases that did not respond to roentgen ray later failed to resolute under radium.

Investigation of the relapses following roentgen ray treatment shows that 55% of failures were in patients who had previous fractional doses of ray. Ninety-five per cent of the cures were accomplished with from one to three massive doses of filtered ray which should teach us that, unless we are capable of dosing our tubes and carrying out the massive dose technique, other methods of treatment should be selected.

Experience teaches us that the few cases that fail to resolute under x-ray also fail to respond to radium and also that radium improperly applied has all the unfortunate sequelae that x-ray has in these cases. Here the importance of a correct diagnosis, careful technique, and massive doses applies to both forms of therapy. In one's enthusiasm for radium and x-ray, one should not be blind to the occasional advantages of curetting, fulguration, or excision in certain cases. The dermatologist who insists on the exclusive use of radium or x-ray, especially if there is a possibility of or obvious gland involvement, is not giving his patient the best chances for his life.

In conclusion, let me again insist that the cure of skin cancer is no longer a matter of concern to the dermatologist who employs the modern technique of radium and x-ray. He accepts and undertakes the cure of the lesion as one of his easiest and least exacting duties, with positive cures closely approximating 100%.

Really, the massive measured dose technique of giving one and one-half to two erythematous doses of ray through one to three mm. of aluminum constitutes about as ideal form of treatment as is to be seen in modern medicine and surgery. Nearly all of these patients are beyond middle age, many in advanced stages of senility, at which time the thought or mention of even a minor surgical operation produces shock, alarm and anxiety.

Compare this dread to a ten minute exposure of x-ray. If this is distasteful to patients, they need not even leave their homes or beds. Many times I visit these older patients in their homes on my way to the office in the morning, and apply one of my two radium applicators. Then, about lunch time, four hours later, I call again to remove the radium, and in one month have a permanent cure without any pain or scar whatever.

Our results with quinine and salvarsan may be as brilliant but they certainly are not more durable.

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ATYPICAL MASTOIDITIS WITH REPORT OF THREE CASES.

By ELBYRNE GILL, M. D., Roanoke, Virginia.

Etiology, pathology, symptoms and signs of uncomplicated typical mastoiditis are well known to all competent otologists and a mere narration of these conditions would be of no avail. It is the purpose of the writer to report what is to his mind three cases of atypical mastoiditis.

Case I. Carl D., age 11. History:—March 7th, 1920, left ear began discharging. March 11th swelling appeared above his zygoma. On the following day, March 12th, the swelling had extended almost to the median line of the head. Also swelling which resembled erysipelas extended across his face to the left eye. On the following day, March 13th, the right eyelid was swollen shut and on March 15th the swelling had left the eyelids on both sides. The swelling above his zygoma had increased in size and was now extended to the median

line of the forehead. From March 7th to March 15th the patient ran a temperature of 101 to 103.

On March 15th I advised and performed a simple mastoid operation, making the regular mastoid incision, different only in that I carried the incision higher than usual. When the incision extended through the periosteum about eight ounces of pus escaped. Pus was under the periosteum. On exposing the mastoid cortex, two small perforations were found, one just above and one just posterior to the spine of Henle. The mastoid cortex was opened and the antrum entered. There was no pus in the mastoid bone or antrum. The bone was in the stage of hyperemia and there were a few granulations in the mastoid antrum. The infection from the ear and from the evacuated pus was pneumococcus. The patient left the hospital a week following the operation and made a complete and uneventful recovery. The points of interest in this case are:—1. The short aural history which was not preceded by any systemic condition. 2. The sub-periosteal swelling was above the temporal ridge and extended to the median line of the forehead. 3. Absence of any pus in the mastoid process.

Case II. L. T. S., age 50, was first seen March 5th, 1920. Patient gave the history of having had influenza for the week previous and was now suffering with pain in the left ear. Physical examination revealed a red and bulging drum membrane which was incised and was followed by profuse discharge. Patient did not give history of any previous ear trouble. The discharge continued for two weeks, during which time the patient had no mastoid tenderness and no pain but was running a temperature of 101 to 102½ each day. At the end of two weeks, on account of the profuse discharge which showed a pneumococcus infection and considerable elevation of temperature, I decided to send the patient to the hospital where she could have an x-ray examination of the mastoid as well as of the chest. The x-ray examination of the mastoid showed increased density and cloudiness but was not operative from an x-ray standpoint. The x-ray examination of the chest revealed a resolving broncho-pneumonia. In a few days her chest condition cleared up and her temperature dropped to the normal line and remained so for an entire week during which time the aural discharge continued to be profuse. During this week the patient had absolutely no pain and no mastoid tenderness and the second x-ray examination of the mastoid showed a slight increase in the density and cloudiness but was not operative from an x-ray standpoint. The physical examination of the fundus of the ear showed a distinct sagging of the postero-superior wall. In spite of the negative x-ray reports and the normal temperature for a week and absence of any other signs of mastoiditis, a simple mastoid operation was advised for the following reasons:—1. There had been a continuous and profuse discharge for three weeks with no sign of abatement. 2. The distinct sagging of the postero-superior wall.

The operation was done March 26th, 1920. On opening the mastoid cortex, which was very thick, a profuse amount of pus escaped which was under pressure. The entire mastoid process was broken down throughout. There were a large number of post sinus cells. The entire mastoid tip was broken down and removed. A small area of dura was exposed in the middle fossa. The sinus was not exposed. The patient left the hospital one week following the operation. On May 10th, 1920, her hearing in the operative ear was practically as good as in the other. The points of interest in this case are as follows:—1. The absence of mastoid tenderness. 2. Normal temperature for one week preceding the operation. 3. Entire absence of pain. 4. The two x-ray examinations which did not indicate an operation from an x-ray standpoint.

Case III. D. L. R., age 56, was first seen April 20th, 1920. Patient gave the following history:—On April 18th, patient began having pain in the right ear. Had had tonsillitis for a week previous. Physical examination on April 20th showed a marked furuncular condition of his external auditory canal. The swelling was so extensive as to prevent a satisfactory examination of the drum membrane. Patient had considerable pain and marked tenderness of the mastoid tip but not of the mastoid antrum. Pressure on the tragus caused severe pain. His temperature at this time was 103. My diagnosis at this time was furunculosis of the external auditory canal. The patient was placed on treatment for this condition and, when seen on the following day, Wednesday, April 21st, was feeling more comfortable and

his temperature was 101. The swelling of the external canal still prevented a satisfactory examination of the drum membrane. On Thursday morning, April 22nd, I received a telephone call from a member of the patient's family saying that his condition was worse than it had been and that he was suffering most excruciating pain. Examination at this date showed a small perforation in the superior quadrant of the drum membrane in the region of the vault. From it there was escaping a small amount of sero-sanguineous discharge. Patient was exceedingly tender over entire mastoid process. I was satisfied that the patient was suffering from suppurative mastoiditis and, upon that conviction, I advised an operation, provided x-ray examination confirmed my diagnosis. The x-ray examination revealed a marked increased density and cloudiness of the bone. The bacteriological examination of the aural discharge showed a pneumococcus infection.

On Thursday, April 22nd, 1920, a simple mastoid operation was performed. The entire mastoid process was very soft and broken down. Pus was present in the mastoid tip and mastoid antrum. A number of large cells were found posterior to the lateral sinus. Four days following the operation the patient developed erysipelas which disappeared after a week's duration. Patient left the hospital two weeks following the operation and made an uneventful recovery. The points of interest in this case are as follows:—1. History of ear trouble which was of only four days' standing. 2. The extensive furuncular condition which to a certain extent masked the symptoms arising from the middle ear.

612 MacBain Building.

GOITER OPERATIONS.

By WM. F. GRIGG, M. D., Richmond, Va.

This paper is not to advocate any new operations, or an experiment of any kind, but is a plea for local anesthesia, more especially in goiter operations.

Patients are not to be picked up and operated on as you would one with an acute appendix, but should be gone over very carefully from a physical and mental standpoint, at the same time gaining their absolute confidence and assuring them that you are going to give them the very best of attention. By thus getting control of a patient mentally, there is no occasion to steal the goiter, as the patient will submit to an operation under local anesthesia, get on the table with a relatively normal pulse, and go through the operation with as good or better pulse than that with which she began, because she is already mentally cured. More especially is this true if you have taken time to be careful with your technique of the operation, and not to shock the patient by handling the parts roughly or cutting into tissues that have not been well anesthetized.

As a rule, these patients do not come from under a general anesthetic with a good pulse, especially if the goiter is very toxic.

The operation can be done with an anesthetic of low percentage and the tissues well infiltrated and blocked off and, in this way, there is very little if any shock to the nervous system and a good field to work in.

The operation should be done when there are certain definite indications, such as in goiter which causes pronounced pressure symptoms either from pressure on the trachea or blood vessels; in nodular goiter; in goiter which grows rapidly; in painful goiter; in goiter situated or growing down into the thorax when compression will be serious and operation more difficult with the lapse of time; in goiter that is producing symptoms of a toxic nature; in goiter that is colloidal that does not improve under treatment; in any goiter which continues to enlarge despite treatment; in goiter which causes the patient distress because of its unsightliness; and in patients whose general health does not improve and an operation would not be advisable at a later period.

Operation is contraindicated by extreme impairment of the general health; in a patient with greatly damaged heart; if goiter is receding and there is a gradual improvement of the general health.

After the patient has been prepared, select the kind of incision that is best suited for the particular case, but in most cases the low collar incision is the least conspicuous in after life, for this scar is more easily covered by a string of beads. Most patients are very sensitive about the scar, no matter how small it may be, and this low collar incision usually

*Read at the fiftieth annual meeting of the Medical Society of Virginia, in Richmond, October 28-31, 1919.

gives a good ample field in which to work, which is very necessary in local anesthesia work.

All operations should be preceded by a hypo of morphine thirty minutes before the operation, and, if cocaine is to be used, a hypo of morphine and atropine can be given just as the operation is begun, as the morphine counteracts the effects of the cocain and quiets the patient.

If the patient has a tendency to be nervous, it is well to inject the skin with a fifth of one per cent. cocain solution, as it takes effect quickly and gets control of the patient's confidence. The deeper tissues can be injected with a half of one per cent. of novocain, using just as much as you like, as there are no bad after-effects from its use.

Quick and good union of the parts is very necessary for a small scar. The anesthetic should be put well away from the line of incision, not where you expect to cut, but around the goiter completely. In this way there is a well anesthetized field, and one that is not distorted from the fluid injected and will heal rapidly. After reaching the deeper tissues, if there is not the degree of anesthesia desired, more can be injected, as there is not the occasion to hurry as under general anesthesia.

There is less hemorrhage and trauma to the parts under local anesthesia. There is not so much danger of cutting the recurrent laryngeal nerve; the patient can talk and the change in voice will indicate the location of the nerve as in twenty-five per cent. of the cases the nerve is not in its normal location. The parathyroids can better be preserved as there is less hemorrhage, a clean field, no occasion to hurry, and cut parts are well in view. There is no reaction from the anesthetic that might start up hemorrhage from exertion, or give the patient pneumonia.

Some operators who use general anesthetics advocate the injection of local anesthesia, just as if the general anesthesia was not given, to prevent shock. If that is the case, then why not use the local anesthesia only? It requires more patience on the part of the operator and takes longer to perform the operation, but local anesthesia is the safest to use in the majority of cases and the patient should be given every chance for his life, if it does mean more work for the operator.

The technique of the operation is just the same as that of the ordinary operation under general anesthesia. The drainage tube should not be put in the line of the incision but a small tube should be brought through the skin about one inch below the incision in the median line; this gives good drainage and gets good union and a small scar.

In conclusion, if we think the patient has a better chance for his life and faculties in after-life under local than under general anesthesia, then by all means give him the chance as we would like to have it given us, if we were being operated on.

The following are reports of two cases, one of exophthalmic and the other of cystic goiter, operated on under local anesthesia.

Case No. 47. Miss Alice S., age 18, large right exophthalmic goiter of four years' standing; for the last year had grown very rapidly. She was getting very nervous, had to stop school. Pronounced eye symptoms. Was operated on July 17, 1917. Right lobe and isthmus and a small portion of left lobe were removed. She left the hospital on the fifth day and made a splendid recovery. General health is splendid at this time, with no symptoms of a return or other complications.

Case No. 48. Mr. W. M. L., age 38, was operated on October 17, 1917, for a large cystic goiter of the right side. It had been giving him marked pressure symptoms for the last six years and was increasing in size to such an extent as to be alarming to him. He left the Hospital on the sixth day, after the right lobe and isthmus had been removed, and made a good recovery. This being a cystic goiter, there was very little loss of blood and no shock. He left the operating room in a rolling chair and stated he felt better than he did when he entered it, as the operation was over and he felt satisfied.

934 *West Grace Street.*

The Best Testimonial.

"Do you guarantee results in your nerve treatment?" asked the caller.

"You bet I do," replied the specialist. "Why, last week a man came to me for nerve treatment, and when I'd finished with him he tried to borrow $50 from me."—N. Y. Globe.

REPORT OF A CASE OF GENERAL INFECTION DUE TO COLI.

By B. A. POPE, M. D., Newsoms, Va.

In the absence of any literature on this subject, we will not attempt a detailed discussion of this rather rare infection, but wish to report a case, giving briefly some of the symptoms and the treatment employed.

On March 8th, 1921, a colored boy, age 10 years, consulted us because of a general malaise, slight fever, diarrhea, pain in the back above the waist line and in the bowels in the region of the umbilicus. Two days later I was called to see this boy. At 11 A. M., temperature 104° with pain still in back and bowels and with slight diarrhea, heart and lungs negative. No urinalysis was made.

Suspecting typhoid fever, a blood culture was taken and sent to the State Board of Health for examination. They reported septicemia due to colon bacilli. A few days later, on request, another culture was sent, and the first report confirmed.

The family history was negative, general surroundings good. There are six children in the family, ages ranging from three years to eighteen years, and all save one boy about eighteen, were taken down one after another, ranging over a period of about three weeks.

In none of these other cases was the blood culture confirmed, although they all had similar symptoms.

The general treatment was a carbohydrate diet, sulphocarbolates and citrate potash by mouth, with bichloride mercury intravenously. When the bichloride was given early in the disease, its duration was shortened.

In reporting these cases I wish to stress the importance of a blood culture, as we in this section, are prone to give fever cases too much quinine, on the assumption of a malarial infection.

LABORATORY NOTE.

This is the first case of a true B. Coli septicemia in my experience. On two or three occasions this organism has been found but I was unable to obtain second cultures for confirmation. I feel that a second culture should always be examined to confirm the result before making a report. The colon bacillus found in this case was in no way peculiar culturally.

AUBREY H. STRAUS.

Public Health

Bacteriological Laboratory of The State Board of Health.

Owing to the increasing demand, our regular days for making Wassermann tests have been changed from Monday, Wednesday and Friday to Monday, Tuesday, Thursday and Friday. Certain questions about the Wassermanns are so frequently asked us that I will answer them here. We use only a single cholesterinized antigen. Only "4+" reactions are reported "positive," "3+" reactions are reported "doubtful positive," and all others are reported negative. A single test should never be considered as conclusive unless borne out by the clinical manifestations.

We cheerfully make second tests whenever requested. Furthermore, we are glad to have our work checked by other laboratories and where differences occur, it is helpful to us to know about them. For real comparative work, however, the blood submitted should be *identical*.

As warm weather approaches, let us again issue warning that all dogs' heads should be shipped us *iced*. Many reached us last summer too decomposed for examination.

Time is saved by addressing all communications directly to the Laboratory, 12th and Clay Streets, Richmond, Va.

AUBREY H. STRAUS, *Bacteriologist*.

The Truth About Medicine

During April the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

Armour & Co.:
Suprarenalin Solution—Armour.

The Diarsenol Co.:
Silver Diarsenol.
Silver Diarsenol 0.05 Gm. Ampules.
Silver Diarsenol 0.1 Gm. Ampules.
Silver Diarsenol 0.15 Gm. Ampules.
Silver Diarsenol 0.2 Gm. Ampules.
Silver Diarsenol 0.25 Gm. Ampules.

Hynson, Westcott & Dunning:
Mercurochrome—220—Soluble.

Figures Never Lie.

"What are the chances of my recovery, doctor?"

"One hundred per cent. Medical records show that nine out of every ten die of the disease you have. Yours is the tenth case I've treated. Others all died. You're bound to get well. Statistics are statistics."—The American Legion Weekly.

Secretary's Announcement

Circulating Medical Library.

The books listed in this column may be borrowed by members of the Medical Society of Virginia in good standing, for a reasonable period of time. All are new and should prove valuable helps to general practitioners and also specialists. No red tape is required—simply write a card to the office of the society giving the name of the book wanted, your name and your address. The book may be kept for a period not exceeding thirty days. This plan has been worked out by the Publication Committee and, if this field of interest is developed, our library will be enlarged. Members are expected to pay postage only on the return of the book to this office.

Tuberculosis of Children, MUCH.
Practical Chemical Analysis of Blood, MYERS.
Human Heredity, REDFIELD.
Diseases of the Chest and Principles of Physical Diagnosis, NORRIS-LANDIS.
Sexual Impotence, VECKI.
Pasteur, the History of a Mind, DUCLAUX.
Care and Feeding of Southern Babies, WILSON.
Arteriosclerosis and Hypertension, WARFIELD.
Syphilis, HAZEN.
Diagnosis and Treatment of Brain Injuries, SHARPE.
Wounds of Lung and Pleura, MORELLI-DAVIS-IRVING.
Human Parasitology, RIVAS.
Practical Physiology, BURTON-OPITZ.
Massage and Exercises Combined, JENSEN.
Short History of Nursing, DOCK-STEWART.
Duodenal Tube, EINHORN.
Diseases of the Intestines and Lower Alimentary Tract, BASSLER.
Devlopment of X-ray Plates and Films, WENDELL.
Psychiatric-Neurologic Examination Methods, WIMMER-HOISHOLT.
Practical Massage and Corrective Exercises, NISSEN.
Bacteriology for Nurses, CAREY.
Physiology and Biochemistry in Modern Medicine, MACLEOD.
Psycho-Pathology, KEMPF.
Practical Tuberculosis, GAMMONS.
Compend of Physiology, BRUBAKER.
Handbook of Diseases of the Rectum, HIRSCHMAN.
Surgical Shock and the Shockless Operation Through Anoci-Association, CRILE-LOWER.
Fundamentals of Human Anatomy, PITZMAN.
An Epitome of Hydrotherapy, BARUCH.
Manual of Obstetrics, HIRST.
Manual of Obstetrics, 2nd edition, DAVIS.
Diseases of Infants and Children (2 vols.), GRIFFITH.
Pathogenic Bacteria and Protozoa, McFARLAND.
Nervous and Mental Disases, CHURCH-PETERSON.
Pope's Manual of Nursing Procedure, AMY E. POPE.
After Treatment of Surgical Patients (2 vols.), BARTLETT.
Orthopedic and Reconstruction Surgery, ALBEE.
Diseases of Nutrition and Infant Feeding, MORSE-TALBOT.
Operative Surgery, McGRATH.

Nine Per Cent Dividend!

It has been estimated that the physicians of Virginia pay from fifty thousand to seventy-five thousand dollars annually for telephone service. Since the war, several companies, chiefly subsidiaries of the American Telephone and Telegraph Company, have either been allowed to increase their rates or have been allowed to continue the arbitrarily fixed rates created by the former Postmaster-General. A recent notice sent out by the local company contained the cheering information that the nice dividend of nine per cent had been declared and that its stock was therefore selling at, or better than, par. The companies, therefore, expect to have no trouble in raising money for further extensions, etc.

On what grounds these increases were granted is not known. Their plea before the State Corporation Commission for permission to make increases does not have the same ring as their jubilant notice to the public of a nine per cent dividend. It is our estimate that the increases granted taxed on an average each physician in the State not less than fifty cents per month—which totals more than twelve thousand dollars per year from this source. This information, believed to be correct, is given you that you may know where some of your money goes.

G. H. WINFREY, *Secretary-Treasurer.*

Medical Education

The Medical School of the University of Virginia.*

In order that a wise decision may be reached as to where the State of Virginia should develop the Medical Department of the State University, we must begin with a clear conception of what, in its essence, medical education is.

Medical education is an elaborate process, involving:

(1) Considerable training in science before the student enters the medical school:

*Sent this journal for publication by Dr. Theodore Hough, dean of Department of Medicine at the University of Virginia.

(2) Four years in the medical school; and
(3) An interneship of a year or two after graduation from the medical school.

Even at the end of this elaborate process the graduate in medicine is hardly yet a doctor; he is, however, ready to enter upon the cautious practice of the profession, with a training that, if he is industrious, will make of him a sound practitioner of medicine and surgery.

(4) Practice or experience, therefore, rounds out medical education.

There are thus four successive stages through which the young practitioner passes: First, he gets a scientific training in fundamental general science. This he receives in college. Second, he gets four years of training in the medical sciences and in the main clinical branches. This period he spends in the medical school. Third, he gets a year or two of hospital interneship in the university hospital or some other hospital. Fourth, he begins the practical career which ultimately equips him as a practitioner of medicine.

I have said that the prospective medical student passes the first stage in college. There he is supposed to master the technique of physics, chemistry and biology to acquire the important fundamental scientific conceptions which he will need throughout his scientific career. Time was when persons connected with independent or proprietary schools of medicine supposed that this preliminary scientific instruction could be furnished by the medical schools themselves, and a few schools undertook to furnish it. But the effort was not successful, because even practitioners of medicine came to see that it is not only important to learn scientific laws and facts, but that it is even more important for the young student to breathe the atmosphere of science in laboratories where a spirit of inquiry prevails, and to work with teachers who have a broad scientific training and outlook. This atmosphere and these teachers are to be found only in institutions of learning, and for this reason it is now universally admitted that the student must receive his fundamental scientific training in a well equipped and well developed college or university.

We come next to the medical curriculum proper, the four-year course leading to the M. D. degree. What is the object of this course? Its object is evidently not to make doctors, because, if such were case, the four-year course would not have to be followed by an interneship in a hospital. The four-year medical course can, at most, ground the student in the fundamental medical sciences, train him in the art and technique of diagnosis and give him a limited practical experience in using his knowledge and his technique under the eye of trained teachers; thus, by the time he leaves the medical school the student will have mastered the tools which will ultimately enable him to practice medicine and surgery with safety and intelligence. Medical education is, as has been well said, mostly education, not mostly practice. The range of disease is so vast that it is utterly impossible for the student to master it or to master any considerable portion of it during his four-year course in the medical school. Indeed, he spends over two years learning anatomy, physiology, chemistry, bio-chemistry, pharmacology, etc., which are, once more, only the tools by means of which he is going to grapple with the problems of disease. Then follow two brief years in which at the most he can be trained how to use the technique and knowledge which he has been acquiring, how to observe, how to reason, and how, in a few representative instances, to deal with pathological conditions. The medical curriculum, therefore, does not produce doctors. It trains men in the knowledge and use of a technique by means of which they may in time hope to become physicians and surgeons.

Where can the student best get his training?

In the old days when the medical school, without any preliminary requirement and without any interne requirement, used to turn out doctors in large numbers, medical education was in the hands of local groups of physicians; but, as the resources of science increased, and as men began to realize that even a four-year medical course could not make a doctor, the seat of medical education was transferred from the local proprietary group to the university. The independent medical school has practically disappeared in the last ten years, and it has disappeared because it does not fulfill the conditions required by modern medical education. The universities have simply had to take charge of medical education, because they alone have the facilities and they alone have the correct point of view and spirit. Universities exist to train men not in the immedi-

ate doing of practical tasks but in the discipline and the technique through which practical tasks may be ultimately accomplished in the most enlightened and progressive manner.

At the conclusion of his four-year course of study our young graduate in medicine has acquired the fundamentals of the underlying sciences; he has been taught how to apply his knowledge to the observation of pathological conditions, how to make a diagnosis, and in a limited way how to manage a few representative diseases. Now he has his armament, his equipment, his tools, his point of view. At this stage he enters the hospital, where, if he has been well trained up to this time, he will make rapid progress in learning how to deal with the varied conditions which he encounters in the wards and dispensary. At the end of a year or two he should be ready to go out into the world, preferably in association with an older physician, but in any case his progress towards independence should henceforth be rapid and substantial.

With this brief account of medical education I suspect that most teachers of medicine in these days would be disposed to agree. You will observe that the first two stages belong on this view of the case to the university. There is here in Virginia, as I understand it, no difference of opinion on these points. Everybody agrees that the university should control the teaching in the fundamental sciences and everybody agrees that the university should organize and conduct the medical department. There is but one question to be answered, namely, where should the university conduct the medical school—on its own campus or in a remote city such as Richmond?

Where should the medical school be located?

If the university were itself situated in Richmond or Norfolk, nobody would dream of suggesting that the medical school should be located somewhere else. That is, everybody would admit that the school would be stronger, and university administration would be more effective, if the entire university were concentrated. Everybody would admit that university spirit would be weaker and university administration less effective in any department—medicine, engineering, law, or what not—which was removed from the university campus. I take it therefore that, generally speaking, everybody would be in favor of concentration and against dispersion. The burden of proof rests, therefore, upon those who favor removal. They must show that medical education will gain, not lose, by the transfer of the medical school from Charlottesville to Richmond.

In order that the university may train its students most effectually during the four years of the medical course, it needs, in the first place, laboratories, teaching staff and teaching facilities in the fields of anatomy, physiology, pathology, bacteriology, bio-chemistry and pharmacology. These laboratories are not independent of each other, nor are they independent of other scientific branches which the university develops. The various sciences are continuously intersecting one another, so that no one of them and no group of them can be detached without loss to itself and to its fellows. As far as these sciences are concerned, therefore, they cannot be detached from the university without injury to themselves and to other sciences. The medical sciences will suffer if they leave the university campus. And if they suffer, medical education is to that extent injured. This proposition would also, I believe, be accepted by all.

There is, therefore, only one point in respect to which Richmond or Norfolk could possibly be superior to Charlottesville as the site of the university medical school, viz., in respect to clinical facilities. Let us consider this point in the light of what has been previously said regarding the essence of the student's medical training.

For its clinical teaching the university needs a teaching hospital—that is, a hospital the wards of which are connected with laboratories and classrooms in which disease can be studied and in which the art of diagnosis can be taught. There must be patients numerous enough and varied enough to furnish the material by means of which the student can be trained, and by means of which the teacher may continue to be himself a student of the unsolved problems of disease. It is not necessary that this material should be absolutely unlimited in amount or even that it should contain all possible varieties of disease; there must, however, be so many patients that no patient need be worked over by too many students, and there must be variety enough to illustrate the various methods of differentiation which the scientific physician employs in arriving at a diagnosis. If

the clinical material satisfies these conditions, it is of fundamental importance that it should be entirely under the control of the university, and that physicians and surgeons should enjoy the collaboration and stimulus of scientists working in contiguous and overlapping fields. For these sciences, not themselves medical sciences, bear every day more and more intimately on medical progress and medical education.

As compared with a large city, a small university town is at a disadvantage in respect to the development of an out-patient department and a clinic for acute and infectious diseases. Yet the experience of the German universities and of some of the American universities in small towns shows that a good substitute for an out-patient department can be developed by utilizing, first, local material; second, student material; third, ambulant patients who come to the university for diagnosis. Experience also shows that a medical clinic and clinics in the essential specialties can be built up in small places, for patients who seek the university clinic on account of the advantages it offers. The study of infectious disease can be managed in one of several ways and is not of sufficient importance to be the deciding factor.

We come thus to the hub of the whole matter. Can adequate medical and surgical clinics be built up at Charlottesville? The answer is given by Ann Arbor, which has developed one of the best medical schools in the country in a small town, and by Iowa City, which is developing what will undoubtedly be one of the important medical centers of the Middle West in another small town. Ann Arbor and Iowa City are, moreover, mere university towns—both inferior, I suspect, to Charlottesville in respect to the matter which we are discussing. The same answer was long ago given by the German universities. Great and successful medical schools have been developed on the continent by universities situated in small communities. At the time of my study of medical education in Europe, Greifswald had a population of some 20,000; it had a university hospital of 478 beds; Marburg had a population of 20,000 and a university hospital of 664 beds; Tubingen, a population of less than 17,000 with a university hospital of 881 beds; Göttingen, a population of 34,000 with a university hospital of 458 beds. The fact is that a university hospital, adequate in size and in the variety of material, can be developed on the site of the university. Of course there are certain respects in which these hospitals are less developed than the corresponding hospitals in large cities. This is a regrettable loss, but, if one remembers what we have said above as to the precise function of the medical school in medical education, it is clear that these defects are not so very serious, since they can be remedied by the subsequent experience of the student as interne. To some extent, time cures the defect, for the small town becomes larger; and though it may never reach metropolitan size, Charlottesville will in course of time doubtless contain in itself and its immediate vicinity a population numerous enough to remedy in a measure the one disadvantage which it has to combat.

The real question, therefore, is this: Is the university clinic, situated upon the university campus in close contact with scientific workers and scientific ideals, likely to be a better training school than a department of medicine situated in a remote city away from university control and university stimulus? For, as I have urged, the medical school is a training school; it is not the whole of the student's medical education; it has in any event to be supplemented by an interneship. "No one assumes," says Dr. Cole, Physician-in-Chief to the Hospital of the Rockefeller Institute, "that immediately after a student obtains his degree he is a capable or even satisfactory practitioner of medicine. Where will the student get the wider experience and practice in technique? He will get it in the hospital or in actual practice."

There is another consideration to which I should be disposed to attach a good deal of importance. For many years medical education was in this country in the hands of practising physicians. Some years ago the teaching of the so-called laboratory branches was placed in the hands of full-time men who devoted their entire time to their respective subjects. Meanwhile, practising physicians continued to teach the clinical subjects. It is now becoming very clear that clinical teaching like laboratory teaching is a man's job; the part of the practitioner and of the practising physician is therefore becoming more and more restricted, less and less important. There is therefore from this point of view less and less

to be gained from locating the university department of medicine in a large city as such. The same is true of many of the facilities in the way of hospitals that are located in large cities. Municipal hospitals and other establishments supported by endowment or subscription, but in themselves not controlled by the university, are of steadily diminishing importance. The teaching of medicine, in a word, requires not quantity of material, but quality. Granted a minimum, it is much more important that the university control its material completely and that the university be equipped for its efficient use than that the university medical school should be affiliated with or related to a number of institutions which it does not completely manage.

Dentistry, Pharmacy and Graduate Schools.

The other questions which are raised now as to the location of the dental school or the school of pharmacy are not of prime importance. Iowa City has a very large and prosperous dental department, so that it is quite obvious if the State wishes to develop dentistry as a department of the university it can be done at Charlottesville. The same is equally true of pharmacy, though a question might be raised as to whether pharmacy should in these days be regarded as a university department. As to graduate work, there is a good deal of confused thinking. If graduate work means research, there is an added reason for proximity to the scientific departments of the university—an added reason for the university location; if, however, graduate work means polyclinic opportunities for men in practice, then only the great cities—Berlin, Vienna, New York, Chicago, etc.—have much to offer.

In my judgment the most important factor is *university contacts, ideals and activities.* The Medical Department of the University of Virginia must train physicians in a scientific spirit and it must advance our knowledge of disease. All the sciences known to man and others that the future will develop play a part in both these processes—both in training students and in investigating the unsolved problems of disease. Team play in which all the resources of science are brought to bear is possible on the university campus; it cannot be secured elsewhere to anything like the same extent. *It is easier and cheaper to bring patients to Charlottesville than to reproduce the university laboratories, workers, libraries, and spirit anywhere else.* Defects have to be remedied in either case; but the Charlottesville defects can be largely remedied by a proper interneship; the Richmond defects are inherent and cannot, I should fear, be remedied at all.

Expense.

As far as I can observe, the question of relative expense is of little practical importance. The Charlottesville hospital is excellent but will need extension. New permanent laboratory facilities will have to be provided. The Richmond plant is more extensive, but is of no considerable value. The difference in investment required either for the creation of the medical department or its maintenance would not be enough in either case to influence opinion one way or the other.

Under these circumstances, if the question were put to me as to where the State of Texas should locate its medical school, I should say at Austin, not at Houston or San Antonio. If the State of Iowa asked me the question, I should say at Iowa City, not at Des Moines. If the State of Michigan asked, I should say at Ann Arbor, not at Detroit. If Wisconsin asked, I should say Madison, not Milwaukee; and now that Virginia asks, I should say for the same reason Charlottesville, not Richmond or Norfolk. I should add that in every case if the decision is made in favor of the university town, there must be legislation such as has already been adopted in Iowa and in Michigan for the purpose of facilitating the flow of clinical material to the university hospital.

Conclusion.

One hesitates to participate in discussions of this kind, because, as a rule, they cannot be decided simply upon the basis of merit. Local or institutional interests usually arise to confuse the issue; and so the solution adopted is either a compromise or else a victory for the party which can apply the greater pressure. But the present situation is plainly different; I have accepted the invitation to confer with you because I have become convinced that all parties—the physicians of Richmond, the university authorities and the lay members of this Commission—desire to find and to adopt the sound solution. It is of the highest social and educational importance to this Commonwealth that the Commission should pursue this policy, for the decision which you reach will be a

permanent one; it will for all time determine not only where the State of Virginia is to create its medical school, but what type of medical school the State will develop. It is my conviction—a conviction born of observation over a very wide area—that Virginia will hardly be able to develop a school of the highest grade, except as an immediate part of the State University at Charlottesville. A serviceable institution can be undoubtedly created elsewhere, but it will cost as much, and, lacking the cooperation and stimulus of other university departments, will, I fear, necessarily be upon a somewhat lower scientific and educational plane.

(Signed) ABRAHAM FLEXNER.

March 24, 1921.

Proceedings of Societies

The Southwestern Virginia Medical Society

Held its semi-annual meeting in Pulaski, May 11 and 12, with the largest attendance in the history of the society. Interesting papers were presented by a number of the members. The symposium on "Cardio-Vascular-Renal System" was handled by Drs. J. W. Preston, S. B. Cary and A. P. Jones, of Roanoke; F. H. Smith, Abingdon, and A. B. Greiner, Rural Retreat. This was freely discussed, Dr. L. G. Pedigo, of Roanoke, opening the discussion. Dr. Stephen Watts, of the University of Virginia, by invitation, made an address on "Surgery of the Breast." Mr. G. H. Winfrey, secretary-treasurer of the Medical Society of Virginia, was in attendance and gave a short talk on non-medical subjects. A banquet at Maple Shade Inn featured the evening session of the first day.

The next meeting will be held at Marion, September 21 and 22, at which time new officers and the delegates to the Lynchburg meeting of the Medical Society of Virginia will be elected. Dr. W. R. Rogers, Bristol, is at this time president of the Society and Dr. E. G. Gill, Roanoke, secretary-treasurer.

Valley Medical Association.

There was an attendance of over fifty out of a membership of a little more than sixty at the meeting of this association in Staunton, Va., May 26. Dr. M. J. Payne, of Staunton, is president; Dr. Chas. E. Conrad, Harrisonburg, vice-president; Dr. Ashby C. Byers, Harrisonburg, secretary, and Dr. J. M. Biedler, also of Harrisonburg, treasurer.

Among those reporting clinical cases at the morning session were Drs. Conrad and Miller, of Harrisonburg, and Drs. Bradford, Payne, Bell and Phelps, of Staunton. A number of interesting and instructive papers were read at both morning and afternoon sessions. Between these sessions, luncheon was served those attending and in the evening a most enjoyable smoker was tendered the visitors by the local profession.

The next meeting is to be held at Winchester, in September, 1921.

Medical Society of Northern Virginia and District of Columbia.

With more than seventy members in attendance, this society held its semi-annual meeting in Alexandria, Va., May the 18th, the opening session being at 10 a. m. A recess was taken at 1:30 for a luncheon given those in attendance. Several interesting papers were read and the following officers were elected for the ensuing year: President, Dr. Stephen Harnsberger, Warrenton, Va.; Vice-Presidents, Drs. Wm. L. Lewis, Kensington, Md., and Daniel Borden, Washington, D. C.; Recording Secretary, Dr. Wm. T. Davis; Corresponding Secretary, Dr. Jos. D. Rogers; Treasurer, Dr. Robt. S. Lamb, the last three of Washington, D. C.

The next meeting will be held in Washington, November 16, 1921.

The Association of Southern Railway Surgeons,

At their annual meeting in Mobile, Ala., in May, elected the following officers: President, Dr. T. D. Walker, Cochran, Ga.; Vice-Presidents, Drs. J. W. McGehee, Reidsville, N. C.; H. R. Black, Spartanburg, S. C., and R. J. Griffin, Moundsville, Ala.; Historian, Dr. Geo. Ross, Richmond, Va.; Secretary-Treasurer, Miss Edith A. Foltz, Washington, D. C. New members of the executive council are Drs. W. S. Nash, Knoxville, Tenn., and D. K. Briggs, Blackville, S. C. Those holding over are Drs. F. R. Gobbel, English, Ind.; E. P. Solomon, Birmingham, Ala., and E. D. Martin, New Orleans.

The South Piedmont Medical Society,

At its semi-annual meeting in April, elected the following officers for the ensuing year:—President, Dr. Elisha Barksdale, Lynchburg; Vice-Presidents, Drs. F. J. Gregory, Keysville; C. L. Bailey, Danville; R. H. Fuller, Clover; D. P. Scott, Lynchburg; Secretary-Treasurer, Dr. George A. Stover (re-elected), South Boston.

The Virginia State Nurses' Association and the Virginia State League of Nursing Education.

Met jointly in Danville, Va., May 25-26-27. In addition to papers read on subjects pertaining to general efficiency of hospitals and training schools, round table conferences were held for public health, institutional and private duty workers.

At the meeting of the League of Nursing Education, well prepared papers were read by Miss Celia Brian, superintendent of the Danville General Hospital, and Dr. J. Allison Hodges, formerly of the Hygeia Hospital, Richmond. The subject of Miss Brian's paper was "The Future Training of the Student Nurse from the Standpoint of a Nurse," and of Dr. Hodges' paper, "The Future Training of the Student Nurse from the Standpoint of a Physician."

The president of the League of Nursing Education embodied in her address a review of the advancement of nursing education, since the organization of the National League in 1893, which showed at various times the attempts of local physicians in various sections to retard the progress of nursing education, each time, however, reacting beneficially, by gaining the high minded support for higher standards, from the medical profession, the nursing profession and the laity in general.

Dr. Hodges' paper related mostly to the inequality of the supply and demand of both student and graduate nurses, claiming the shortage of students was due to educational requirements for admittance to training school and to the three years' course. It was not the desire, the speaker said, to be destructive, but on the contrary to rectify an economic condition, if it existed, and to be both constructive and conservative. He also referred to the necessity of training attendants.

In the paper of Miss Brian's and in the discussion of same, the following facts were most forcibly brought out:—

First.—That the 3 years' course has been taken unfair advantage of by the majority of hospitals, as from the onset the 3 years' course was to be divided into a schedule of 56 hours weekly and not to work students 12 to 18 hours as was done under the old working basis.

Second.—Hospitals are primarily for the care of the sick and all hospitals should not endeavor to be institutions of learning or have training schools for nurses attached to them, as it reacts harmfully to the hospital, the patients and the physician, unless proper standards can be maintained. Hospitals unable to maintain the curriculum as outlined by the Virginia League of Nursing Education for the Training of Nurses should employ graduate nurses, or attendants, or both.

Third.—Hospitals unable to provide suitable facilities, etc., for the teaching of student nurses or unable to meet the requirements of the State Board of Nurse Examiners could be used for a training school for attendants. The training of attendants has been seriously and earnestly advocated by the Virginia State Nurses' Association for many years; in fact, in 1918 a law was enacted by the State Legislature which gave the power to the State Association through its examining board to open centers for training attendants at their discretion. It was entitled "An Act to Train Attendants" and was an emergency measure for the war, but was so worded that it could be maintained thereafter by legislative proceeding.

Fourth.—Answers to questionnaires read showed that 50% of the schools in the State had a sufficient number of students; these schools being those that maintain the highest standards.

Graphic charts were displayed showing the concensus of opinion of graduate nurses, who had been written to in order to come at some definite conclusions and figures.

Graduate nurses advocating a 2 years' course for students in training, 19%; those advancing a continuance of the 3 years' course, 73%; advocating a 2½ years' course, 2%; advocating a 4 years' course, 1%; graduate nurses who would recommend training to other young women, 76%; who would not advise other young women to go in training, 11%.

EDUCATION OF GRADUATE NURSES BEFORE GOING IN TRAINING.

Private school only, 24%; grammar school only, 11%; high school 1 year, 6%; high school 2 years, 10%; high school 3 years or more, 17%; high school graduates, 52%; normal school, 12%; attending college, 20%; college or university degree, 6%; no answers received, 5%.

Seventy-one per cent of graduate nurses were not dependent on training school allowance while in training, 29% were dependent.

Ninety per cent were satisfied with training received; 8% were not.

Central training schools for unrses were again strongly advocated. Resolutions adopted included the following: In view of the fact that some nurses, not the majority, however, are refusing to take night work, thereby working hardships on those who unselfishly answer all calls, we individually and collectively protest against this and pledge our support to the correction of this practice. Letters will be sent to all doctors of the State, recommending them to pay not over $20.00 weekly for the services of attendants so as to prohibit any excessive charges.

Miss Anne Gulley, of Leesburg, Va., was re-elected president of the State Association.

Miss Rose Zimmern Van Vort, superintendent of the Stuart Circle Hospital, Richmond, was elected president of the Virginia State League of Nursing Education for the fourth consecutive year.

Book Announcements

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the A. M. A. for 1920. Cloth. Price, postpaid, $1.00. Pp. 72. Chicago: American Medical Association, 1921.

While New and Nonofficial Remedies consists in part of descriptions of those proprietary medicines which the Council deemed worthy of consideration by the medical profession, the Annual Reports of the Council on Pharmacy and Chemistry describe the preparations which the Council finds unworthy of recognition. In addition, these annual reports contain other announcements of the council.

The present volume contains a number of interesting reports. Thus we find a statement which makes it clear that many of the large pharmaceutical houses are definitely opposed to the work of the Council and will remain antagonistic until a very large proportion of the medical profession will give the Council their active support. The volume also contains a report on some digitalis preparations which the Council examined and declared to be pharmacopeial digitalis products and therefore do not require the control of the Council.

Human Heredity. By CASPER L. REDFIELD, Author of Control of Heredity, Dynamic Evolution, Great Men, etc. Chicago. Heredity Publishing Company. 1921. Cloth. 107 pages. Price, $1.50 net.

Operative Surgery. For Students and Practitioners. By JOHN J. McGRATH, M. D., F. A. C. S., Professor of Surgery, Fordham University; Consulting Surgeon to the Peoples Hospital, etc. Sixth Revised Edition. With 369 illustrations, including full-page color and half-tone. Philadelphia. F. A. Davis Company, Publishers. 1921. Cloth. 863 pages. Price, $8.00 net.

Institute on Venereal Disease and Social Hygiene for 1921.

Owing to the success of last year's Institute on Venereal Disease and Social Hygiene, Surgeon General Hugh S. Cumming is planning a more extensive series of courses for this Fall. It is to be held in Washington, either from October 31 to November 12, or from November 21 to December 3. From twenty to thirty courses are offered and the faculty will be composed of 75 to 100 leading authorities.

Censorship of Movies.

We note from *The Social Hygiene Bulletin* that Governor Miller of New York has signed the Clayton-Lusk bill, providing for the regulation of moving pictures in New York, thus making it a law. From this it is certain that efforts will be made both within and without the moving picture industry to improve the pictures.

U. S. Public Health Hospitals.

Much progress is being made in the U. S. Public Health Service hospital program. Nine new hospitals, which will accommodate more than 3,000 patients, will soon be ready for occupancy. These are principally in the western states but one is to be at Dawson Springs, Ky. These hospitals are for the treatment of tuberculous, nervous and mental, and general patients.

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Editorial

Our New Medical School.

The doctors of Virginia have a grave duty before them. They have also a great privilege and opportunity. It is a duty to themselves, a duty to the people of this State, of this and succeeding generations, to give intelligent direction to this medical school question. It is a privilege which has been never before, in all the years of Virginia's history, so squarely and clearly put within the doctor's power to do something great for medical education in the Old Dominion.

For more than a year, the VIRGINIA MEDICAL MONTHLY has conducted a department on *Medical Education*. In this department an effort has been made to lay before our readers the best thought on the subject of medical education. The reports of Special Commissions and studies of the subject by experts in this field have been quoted. And now, a commission, appointed under the direction of the last Legislature, has completed its investigation and has prepared its report on medical education in the State of Virginia.

The commission, according to published reports in the daily press, came to the conclusion that there should be only one State supported medical school in Virginia; that this school should be under the University of Virginia; that the details of organization of the school should reside in authorities of the University of Virginia; that a divided course, first two years to be at the University in Charlottesville and the last two in Richmond, would be expensive and unwise; and that the location of the entire medical department of the University of Virginia, controlled and operated by the trustees of that institution, should be in Richmond.

Ultimately, no doubt, the decision as to the location of the Medical Department of the University of Virginia will be a matter which the Legislature must settle. The members of the next Legislature who will settle this issue may be influenced in their decision largely by the doctors of the State. The doctors have no right to allow this expert and special knowledge which they have on this subject to remain dormant and unused. They should, at once, in every locality take a personal, active, and determined interest in this question and see that the views and opinions of the medical mind of this State are felt in a telling way when the decision is put up to the Legislature for action. Not only is the proper location of this one school a most important and urgent matter, but also the general plan, upon broad and scientific lines for the development of this one medical school of the State, is a companion and interlocked problem of equal importance. This one medical school of the future should be better than either of the two we now have; if so, the opportunity is not lost and Virginia will be better off in this important field in the future than in the past.

The commission's report should be studied carefully by the doctors throughout the State. Having fairly and impartially studied the arguments presented and having weighed the matter as related to medical education in its best form, the opinion as to the location of this department of the University should be decided by each individual in his own mind. Having reached an impartial decision, it is hoped that each doctor in the State will take off his coat and fight for the establishment of the medical school of the highest type. Doctors of this State can be a strong factor in intelligently directing the Legislature on this subject and should exert this influence.

In connection with this subject, our readers are referred to the following extract from the lay press describing plans for the amalgamation of the Columbia University and the Pres-

byterian Hospital, New York City, which shows some of the problems found in our own State. The details of reorganization of these institutions and the formation therefrom of a greater and more efficient medical school are hinted at. In this article, we may see some of the factors in the evolution of our medical school problem. As stated, these plans are the result of twenty years of study and negotiation.

Medical Centre Plans Announced.*

Plans for the organization of the $15,000,000 medical centre which is to arise in New York City, through the permanent alliance just effected between the Medical School of Columbia University and the Presbyterian Hospital, have been announced at the university. The plans, drawn up by the Columbia Faculty of Medicine, and sanctioned by both the trustees of the University and the Board of Managers of the Hospital, embody the final stages of development in a broad scheme of administration and control whose fundamentals, stated by President Nicholas Murray Butler nearly twenty years ago, began progressively to take working form under the deanship of Dr. S. W. Lambert, who resigned two years ago.

The appointment of Dr. Allen O. Whipple of the Presbyterian Hospital staff, as Professor of Surgery and Director of the Surgical Service, and of Dr. Walter W. Palmer of Johns Hopkins University, as Bard Professor of Medicine and Director of the Medical Service, also were made known. These two men with the greater part of their staffs at the hospital will confine their efforts to work in the school and hospital. Dr. Herbert B. Wilcox has been appointed Carpentier Professor of Diseases of Children to succeed Dr. L. Emmett Holt, who has resigned after what his colleagues described as twenty brilliant and successful years of service as head of this department.

It has been decided to defer the installation of the university plan of organization in the department until the completion of the new school and hospital. It is planned, however, to increase the laboratory and scientific work as rapidly as possible so that when the new plant becomes available the proper organization shall have been developed.

The Departments of Medicine and Surgery will be reorganized on the university basis on July 1, 1921, as far as may be possible with the present facilities at the Presbyterian Hospital and with the budget at present available.

*Taken from N. Y. Times, of Sunday, May 22, 1921.

Special Institutes Planned.

As announced by Dean William Darrach, the plans for the new medical centre, assured by gifts of about $11,000,000 already made, contemplate the building up of special institutes, utilizing such hospitals as the Sloane Hospital for Women and the Vanderbilt Clinic, and the expansion of research and graduate work.

Discussing the question of hospital and dispensary, the authors of the plan assert that the University Hospital must be in close geographical and functional relation to the medical school. "It must be planned to contain sufficient beds to supply the clinical material necessary for classes of 100 students," it was stated. "The school should then limit its undergraduate teaching to the University Hospital, except where the clinical material proved insufficient, as for instance at the present time in psychiatry, tuberculosis and infectious diseases.

"If the student is to have a complete picture of a disease, and of more importance, if the patient is to be properly cared for, a longer stay in the hospital should be planned than is now the custom in most of the New York hospitals. The demand for beds is so great that patients are often discharged as soon as they are able to stand the trip home and before they are really able to resume their home duties.

"This should be arranged for by providing good convalescent facilities, a good 'follow-up system' and by a more generous supply of beds. To satisfy these conditions there should be 200 beds for medicine, 200 for surgery and 250 for other specialties.

"It is hoped that later on special hospitals, such as the Sloane Hospital for Women, may be obtained adjacent to the University Hospital for each of the specialties. It is also hoped that the Vanderbilt Clinic will be moved with the school and built on such a scale as to include the outpatient function of that hospital.

Courses of One and Two Years.

"With the development of these special institutes it will be possible to carry on advanced work along the various branches which will furnish facilities for graduate courses in medicine one and two years in length, as well as

larger opportunities for advanced students to become thoroughly competent in special branches of medicine and surgery. It is also hoped that graduate work may also be carried on in the various hospitals at present affiliated with the College of Physicians and Surgeons, which will enable the University to more completely satisfy the demands for instruction and will not limit the usefulness of the school to those who are studying for the M. D. degree."

The student body of the Medical School will be limited in numbers.

The Faculty considers very thoroughly the merits of the various so-called full-time plans for the personnel of the new organization of school and hospital, recommending the adoption of the plan which provides for private practice at the discretion of the clinician with no fee being paid for such service. This plan is in effect at the Rockefeller Hospital.

"The heads of many of the laboratories have long been on the full-time basis and with no legislation they have voluntarily refrained from any outside employment. The results in the advancement of knowledge have proved the value of such an arrangement," the statement continues.

"The main clinical departments shall be reorganized on the full-time basis—medicine and surgery immediately and pediatrics as soon as financial and clinical facilities permit," the statement says. "It is hoped that other departments may later be similarly arranged.

"At the head of each shall be placed a man of such training, ability and character that he may assume full responsibility for and the direction of the general policies of the department, the character of the teaching, the hospital service and the nomination of his associates. It shall be his duty to develop a modern clinic of the best type."

"The adoption of the full-time or university basis is necessary, it is said, for the best type of teaching, for the most successful clinical investigation and for the most skillful care of the sick. The essential principle of this arrangement is that the dominating group of men in the main clinical departments must be free to concentrate their energies on their university and hospital work. Although widely divergent plans of organization are now in force or planned throughout the country, the Columbia view is that there is apparently but little question in the minds of medical educators as to the wisdom and necessity of this main principle. The main purpose is to obtain a more truly university type of clinical teacher.

"The fundamental principle upon which these departments shall be reorganized is that the control of each main clinical department shall be vested in a director, associated with a differentiated group of men who are devoting all their time to the school and hospital, that they may build up and maintain a department where the best intensive clinical investigation and scientific research may be carried on with the teaching of students and the care of the sick."

News Notes

Medical College Finals.

Commencement exercises of the Medical College of Virginia began with the baccalaureate sermon on May 29, by Dr. Broughton, of Grove Avenue Baptist Church, his subject being, "The Doctor and the Community—His Making and Unmaking." At the meeting of the Board of Visitors on the 30th, for the selection of the faculty for the coming year, all changes were of minor importance except in the case of the resignation of Dr. Margaret Hoskins as associate professor of anatomy. On Monday and Tuesday, the usual clinics and meetings of the alumni were held and a smoker was enjoyed by members of the Alumni Association on Monday evening.

The meeting of the alumni on Tuesday morning was largely attended by visitors as well as local men, and the following officers were elected: President, Dr. H. U. Stephenson, Toano; Vice-Presidents, Dr. Harry Bear and Mr. L. C. Bird, of Richmond, and Drs. Elisha Barksdale, Lynchburg, and Prentiss D. Johnston, Tazewell; Secretary, Dr. Greer Baughman, Richmond; Assistant Secretary, Mr. A. L. I. Winne, Richmond; and Registrar, Dr. Clyde F. Ross, Richmond.

At the final exercises on the evening of the 31st, Dr. F. W. Boatwright, president of the University of Richmond, was the orator. Following this, diplomas were presented to thirty graduates in medicine, thirty-four in pharmacy, thirteen in dentistry, and thirteen young women graduates of the School of Nursing of

the Medical College of Virginia. Following the exercises, a reception was tendered the nursing class at Westmoreland Club, by the hospital division of the college.

The following hospital announcements have already been made:—

Johnston-Willis Sanatorium, Richmond.—Dr. Wm. B. McCutchen, Rougemont.

Memorial and St. Philip's Hospitals, Richmond.—Dr. Henry J. Langston, Richmond.

St. Luke's Hospital, Richmond.—Drs. Charles M. Irvin, Roanoke, and Herman I. Pifer, Strasburg.

Retreat for Sick, Richmond.—Drs. Thos. B. Pearman, Jr., and Allan M. Kimbrough, both of Richmond.

Stuart Circle Hospital, Richmond.—Drs. Robt. F. Gillespie, Pounding Mill; John K. Shumate, Pearisburg, and Geo. R. Maloney, Cullen.

Soldiers' Home Hospital, Richmond.—Joseph Coates (undergraduate).

St. Elizabeth's Hospital, Richmond.—Drs. R. Hugh Wood, Floyd; O. O. Ashworth, Richmond.

Tucker Sanatorium, Richmond.—Dr. Thos. D. Davis, Paces.

Virginia Hospital, Richmond.—Drs. Carlisle C. Cochran, Huntersville, N. C.; W. Herman Whitmore, Emporia.

Roanoke Hospital, Roanoke, Va.—Dr. Ira T. Hornbarger, Healing Springs.

Grace Hospital, New Haven, Conn.—Dr. C. W. Putney, Darlington Heights.

Walter Reed Hospital, Washington, D. C.—Drs. Harry Lee Claud, Drewryville, and Francisco J. Casalduc, Porto Rico.

Other graduates of the Medical Department are: Drs. Francis M. Aycock, Lucama, N. C.; Arthur B. Carr, Athens, W. Va.; Roger L. Creekmur, Gilmerton; John M. Davis, Paces; Rob Roy Doss, Drakes Branch; Francis E. Hinchman, Richmond; John K. Richardson, Crewe; Paul A. Robertson, Blackstone; Elmer N. Shockley, Sylvatus; Jos. E. Smith, Wilson, N. C.; Alpheus L. Stratford, Jr., Richmond, and Harry A. Wall, Norfolk.

The Medical Department of the University of Virginia held its finals, as usual, in connection with those of other departments of the University. Being the centennial celebration, this was the most brilliant of the exercises ever held at the University and many alumni and others of eminence, including representatives from foreign countries, were in attendance and participated in the ceremonies. About 5,000 alumni were in attendance and fifty-five classes of University graduates were represented. This year there was unveiled a memorial tablet in honor of the University of Virginia men who died in the World War. This bore eighty names, a number of whom were graduates of the Medical Department.

There were twenty graduates in the School of Medicine this year and all of these, with the exception of one who was recently married, received hospital appointments. The full list of graduates with appointments follows:—

University of Va. Hospital, University.—Drs. Robt. M. Page, Batesville, and Patton K. Pierce, Ralph, Ala.

Walter Reed Hospital, Washington, D. C.—Drs. William R. Morris and Jos. H. Smith, both of Charlottesville, and Millard B. Savage, Norfolk.

Wesley Long Hospital, Greensboro, N. C.—Dr. Ernest H. Alderman, Greensboro, N. C.

Orange Memorial Hospital, Orange, N. J.—Dr. Carl Bishop, Riner, and Edgar M. Tennis, Phoebus.

N. Y. Nursery and Child's Hospital, New York City.—Dr. Harold C. Cox, Brooklyn, N. Y.

King's County Hospital, Brooklyn, N. Y.—Drs. Frank L. Foster, University, and Wm. I. Prichard, Petersburg.

Charity Hospital, New Orleans.—Dr. Frank A. Fox, Greenville, Tenn.

Boston City Hospital, Boston, Mass.—Dr. John S. Lawrence, South Norfolk.

St. Mary's Hospital, Passaic, N. J.—Dr. L. Lebel, Nutley, N. J.

Postgraduate Hospital, New York City.—Drs. Jas. O. Porter, Lynchburg, and R. L. Willis, Chatham.

Ellis Island Hospital, New York.—Dr. C. L. Quaintance, Griffinsburg.

Mass. General Hospital, Boston, Mass.—Dr. James E. Wood, Jr., Charlottesville.

Assistant Pathologist, University of Virginia.—Dr. Wm. M. Sheppe, Charlottesville.

Appointment declined at this time.—Dr. C. Tunstall, Norfolk.

Lynchburg Meeting, Medical Society of Virginia.

The fifty-second annual meeting of the Medical Society of Virginia will be held in Lynchburg, October 18 to 21, inclusive. This will be the fifth time in the history of the society that the annual meeting has been held in that city and, as on former occasions, this promises to be of unusual interest and pleasure.

According to the nature of information desired, communications should be addressed to the president, Dr. A. L. Gray, Richmond; secretary-treasurer, Mr. G. H. Winfrey, 104½ West Grace Street, Richmond, or Dr. George J. Tompkins, chairman of the local committee of arrangements, Lynchburg. Chairmen of sub-committees already appointed are:—Exhibits, Dr. Hunter B. Spencer; meeting place, equipment and accommodation of members, Dr. F. O. Plunkett; entertainment of members, Dr. John W. Carroll; finance, Dr. James Morrison; entertainment of visiting ladies, Mrs. Robert M. Taliaferro.

Before starting on your summer vacation, let us have title of paper you will present at this meeting. Cards will be mailed during the summer, as usual, but yours may reach your office while you are away and be overlooked. Get this off your mind by sending us your title Now.

High Maternal and Infant Mortality.

In the United States in 1919, one mother died for every 135 babies born, and every eleventh baby died before it was a year old. These rates are excessive as compared with those of other countries. Six countries are shown to have a lower infant mortality and 16, in a group of 17, a lower maternal mortality than the United States. Not only is our maternal mortality rate higher than that of most representative countries but it seems to be increasing.

Measures which have proved successful in preventing this waste of life among mothers and babies include: Prompt and accurate birth registration, health centers, public health nurses, special clinics, trained attendants at childbirth, adequate hospital service, education of the mother in maternity and child hygiene, and education of the general public in the significance of a necessity for maternal and infant health.

Married—

Dr. James Morrison Hutcheson and Miss Margaret Erskiné Miller, both of Richmond, June 11.

Dr. James Fairfax Fulton, of Staunton, Va., and Miss Martha Alexander Bell, of Lewisburg, W. Va., June 18.

Dr. John S. Weitzel and Miss Marie H. Woods, both of this city, May 18.

Dr. John Lewis Rawls and Miss Azzie Jueldah Gatling, both of Suffolk, Va., June 2.

Federal Aid Should be Continued to States in Venereal Disease Work.

Since the signing of the armistice, State Boards of Health, assisted by the U. S. Public Health Service, have established in dispensaries and hospitals more than 400 clinics for the free treatment of persons afflicted with venereal diseases (gonorrhea and syphilis). These clinics were established in pursuance of the national educational and medical program for controlling these diseases, which had become a very serious menace to the health of the nation. To aid in the work, the Federal Government appropriated more than two and a half million dollars to be allotted to the States on a fifty-fifty basis; and now every State in the Union has accepted the offer.

At the clinics, diseased persons receive, free of charge or at small expense, the best modern treatment that money and science can provide, and arsphenamine (606) and other expensive drugs are provided for patients who are unable to pay for them. Without this help many infected persons would never be treated; with it thousands have been cured and many thousands of walking sources of infection have been removed. In the last two years more than 200,000 persons were treated in these clinics; and in 1920 alone a million and a half treatments were given.

The last Congress, however, failed to continue the co-operative appropriation and, unless the present Congress comes speedily to the rescue, Federal aid to the States must cease soon after June 30. Industries as well as individuals will suffer from the withdrawal of this appropriation.

Appointments on State Board of Health.

Dr. E. Howe Miller, Danville, Va., has been appointed a member of the Virginia State

Board of Health, for a term of four years beginning July 1, 1920.

Dr. Guy R. Harrison, Richmond, was reappointed a member for a term of four years, and an innovation was made by appointing a woman, Mrs. Charles Hall Davis, of Petersburg, a member, her term of office being for four years, beginning June 17, 1920.

T. B. Sanitorium Site Bought.

A ten-acre tract of land, a quarter of a mile from the North Danville limits, has been secured from Dr. L. L. Vann, as the site for the new home of the Danville, Va., tuberculosis sanitorium. The buildings will shortly be erected at a cost of approximately $50,000, which sum was recently raised by popular subscription.

Dr. William P. Colvin,

Formerly of New York City, but who has been assistant health officer of Danville, Va., for the past three months, left the first of this month for New York City, from which place he and his wife expected to sail on the 11th of June for Ecuador, where he goes to take up health work.

Dr. C. B. Bowyer,

Of Stonega, Va., was a recent visitor in this city, having come on professional business. From here, he went to Boston, to attend the meeting of the A. M. A.

Dr. Thos. J. Tuder,

Keokee, Va., was among the Virginian doctors who recently attended the meeting of the Southern Railway Surgeons' Association in Mobile, Ala.

Dr. Myer Solis-Cohen

Has been appointed assistant professor of internal medicine in the graduate school of medicine, University of Pennsylvania, of which he is an alumnus.

Trustees of Crippled Children's Hospital.

The following doctors are members of the board of trustees of the Crippled Children's Hospital, Richmond:—Dr. L. T. Royster, Norfolk, and Drs. McGuire Newton, Wm. T. Graham, Ennion G. Williams and Stuart McGuire, Richmond.

The American Public Health Association,

On May 1, 1921, removed its offices from Boston to New York, in order to promote closer cooperation with other national health agencies. It is to be one of the agencies composing the National Health Council. A national headquarters office of the Council has been established at 411 Eighteenth Street, Northwest, Washington, D. C., in addition to its co-operative office in New York City. Dr. Livingston Farrand is chairman of the Council, and Dr. C. St. Clair Drake, secretary.

Dr. Karl S. Blackwell,

Of this city, was elected vice-president of the Richmond Chapter of the Randolph Macon Alumni Association, recently reorganized here.

Dr. R. M. Taliaferro,

Lynchburg, Va., was a recent visitor in this city.

Dr. Robert C. Randolph,

Of Boyce, Va., enjoyed a visit to Atlantic City, N. J., in May.

X-Ray Scientists Awarded Gold Medals.

The French Commission, endowed by the Carnegie Foundation, has awarded three gold medals to Dr. Charles Infroit, Dr. Adolphe LeRay, and Dr. Vaillant, head of the Salpetriere Radiogram Laboratory, who is also given 50,000 francs. These were given in recognition of the investigations with the x-ray by these scientists. Drs. Infroit and LeRay both recently died as a result of their x-ray research work. Dr. Vaillant has suffered ten amputations in ten years, losing fingers, then a hand, and finally his left arm. However, he is still experimenting.

Dr. R. D. Tucker,

Of Powhatan, Va., was among those attending the Rural Health Conference which was held in Richmond in May.

Dr. and Mrs. A. R. Shands,

Washington, D. C., have been recent visitors at Dr. Shands' old home place in Prince George County, Virginia.

The New Hospital,

In Hopewell, Va., which is to be conducted by Drs. D. L. and J. N. Elder, of that city, and Dr. H. Aulick Burke, of Petersburg, Va., was opened early this month.

Ambulance for Winchester Hospital.

A new motor ambulance, costing approximately $3,000, has been presented to the Winchester, Va., Memorial Hospital, by residents of that city and Clarke and Frederick Counties. The money for this was raised as the result of a popular and voluntary offering. To

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this time, the hospital has had a horse drawn ambulance.

Public Health Service and Nervous-Mental Diseases.

Medical officers have been detailed by the U. S. Public Health Service to visit the medical colleges of the United States to recruit personnel, especially internes, for the care of nervous-mental patients in Service Hospitals. Dr. J. K. Fuller, who has been directing the clinical work at St. Elizabeth's Hospital in Washington, is visiting southern and western colleges, and Dr. T. J. Heldt, clinical director of the Service Hospital at Waukesha, Mich., is visiting those in the north and middle west.

The American Social Hygiene Association.

Announces that its offices have been changed from 105 West 40th Street to 15th floor, 370 Seventh Avenue, New York City.

Dr. Tom A. Williams,

Washington, D. C., is to give two lectures on "Mental Hygiene" and "Emotion and Fitness" before the General Assembly of the University of Virginia early in July.

Dr. Alfred S. Gruessner,

Of the class of '18, Medical College of Virginia, recently of Cradock, Va., has moved to New Brunswick, New Jersey.

Dr. Chas J. Sager

And a cousin, of Thomas, W. Va., received painful and what came near proving serious injuries, when on a recent automobile trip to visit relatives in Woodstock, Va. The accident occurred about 2:30 a. m., on the Winchester-Martinsburg Pike, where a cable, which was about five-eighths of an inch thick, had been stretched across the road where improvements were being made to the roadway. There were no lights to indicate the cable and they ran into it, ripping off the hood of the car. Both men were caught under their chins and Dr. Sager was severely bruised and was rendered unconscious for a time. His cousin's throat was lacerated to such an extent that about a dozen stitches had to be taken. A somewhat similar accident occurred near the same place a short time previous to this.

Candidates for Legislature.

Two Virginia doctors whose names have recently been announced as candidates for the House of Delegates are Drs. J. Fulmer Bright, of Richmond, and Dr. W. T. Swanson, of Callands, Pittsylvania County.

Stuart Circle Hospital Has Opened Addition to Building.

The new addition to Stuart Circle Hospital, Richmond, which has been in process of construction for nearly a year, was opened on the 6th. It has facilities for the accommodation of between forty and fifty patients, making the total capacity of the hospital more than 150. This addition contains offices, rooms for patients, library, amusement rooms for patients and many other conveniences to be found in only the most up-to-date hospitals.

China to Adopt U. S. Pharmacopceia.

It was recently announced by the Philadelphia College of Pharmacy and Science that the U. S. Pharmacopoeia is being translated into the Chinese language for use in that country. It is understood that, before the war, Germany made an effort to have its Pharmacopoeia adopted and that Great Britain has been trying to have hers introduced since that time, which demonstrates the merit of our own that it has proved acceptable.

Dearth of Doctors in Rural West Virginia.

We note from a recent communication that West Virginia is having some of the same trials and tribulations as Virginia and other States, with regard to supplying its rural communities with doctors. It is stated that the cities of the State are well supplied while in some of the counties people live 15 to 20 miles from the nearest physician.

At the Rural Health Conference, recently held in Richmond, in the discussion of the subject of the need of doctors in rural communities, attention was called to the fact that New Zealand is solving this problem by subsidizing doctors for the country districts.

Madame Curie's Visit a Reality.

Mme. Curie, famous woman scientist and co-discoverer of radium, reached this country May 11, as scheduled, and has been much "feted and toasted" since. She has been the recipient of several medals and honorary degrees and, on May 20, at the White House, in Washington, President Harding presented her with a phial containing a gram of radium, valued at $100,000. This was bought with money raised by American women by popular subscription, that the radium might be used by Mme. Curie in the fight against cancer and other diseases. The intellectual grasp of the woman was illustrated by her reply to Presi-

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dent Harding's presentation speech, her thanks being made in an address of perfect diction. Madame Curie was born in Poland but is now a resident of France.

Mme. Curie's First American Contribution.

The July issue of the *Medical Review of Reviews* will contain a lengthy original contribution by Mme. Curie entitled "The Radio Elements and their Applications." A copy of the July issue containing it will be sent gratis to any physician making the request.

Address the *Medical Review of Reviews*, 51 East 59th Street, New York City.

The Second International Congress of Eugenics

Is to be held in New York City, September 22-28, 1921. Memberships are of two kinds—sustaining and active. Detailed information about these, as well as other matters, may be received from Dr. C. C. Little, Secretary-General, American Museum of Natural History, 77th Street and Central Park West, New York City.

Dr. William L. Gannaway,

Recently of Mendota, Va., is now located at Abingdon, Va.

Dr. W. Paul Speas,

Hickory, N. C., of the class of '11, of the former University College of Medicine, of this city, has been elected secretary-treasurer of the Caldwell-Catawba-Lincoln County (N. C.) Medical Society recently organized at Hickory.

Dr. James A. Hayne,

Columbia, S. C., has been elected president of the S. C. Public Health Association, which was organized at the annual meeting of the State Association in Columbia, in April.

T. B. Clinics Popular.

The Virginia Tuberculosis Association and State Board of Health report that in about seven weeks following April 1, 1921, 1,754 patients were examined in this State for tuberculosis. Many of the counties are clamoring for these clinics which in some cases will be the first move toward the establishment of local sanatoria. In some counties, very little open tuberculosis is shown while in others a large percentage of infection may be found.

Dr. Walter J. Miller,

Johnson City, Tenn., was recently selected president of the Tennessee State Board of Health.

Dr. U. G. Jones,

Who has been doing post-graduate work at the Manhattan Eye, Ear and Throat Hospital, New York City, for several months, will complete the course and return to his home in Marion, Va., about the first of July.

Dr. G. G. Howery,

Until recently of Riner, Va., is now located at East Radford, Va.

Dr. and Mrs. Frank Redwood

And children, of Norfolk, Va., have been recent visitors in this city.

Gets Points From Vital Statistics Bureau.

Following the lead of many of the Southern States, Dr. Carl F. Raver, chief statistician of the Bureau of Vital Statistics of the State of West Virginia, visited Richmond in May, to go over the workings of the Virginia Bureau of Vital Statistics and get pointers for his own office, which has only recently been established.

Dr. Alexander G. Brown, Jr.,

Of this city, was elected surgeon and a member of the council of the Society of Colonial Wars in the State of Virginia, at its recent meeting held here.

Scientists May Secure Copies of Scientific Articles.

Many scientists lack the library facilities which their work demands and are compelled to journey to distant libraries or to try to borrow books by mail. Often it is difficult for them to locate something that is badly needed, and again it may be impossible to borrow it.

The Research Information Service of the National Research Council is prepared to assist investigators by locating scientific publications which are not generally or readily accessible. It will also, as is desired, have manuscripts, printed matter or illustrations copied by photostat or typewriter. The cost of copying varies from ten to twenty-five cents per page. No charge is made for this service unless an advance estimate of cost has been submitted and approved by correspondent. Requests for assistance should be addressed, National Research Council, Information Service, 1701 Massachusetts Avenue, Washington, D. C.

Members of National Economic League.

Among the prominent Virginians appointed to membership in the National Economic League of Boston are Drs. Joseph S. DeJarnette, Staunton, and J. Shelton Horsley, Richmond.

Memorial to Dr. Battey.

In May, a monument was unveiled in Rome, Ga., to the memory of the late Dr. Robert Battey, of that city. The monument was given to the city by the Seventh District Medical Society of Georgia and the chief address, upon its presentation, was made by Dr. Howard A. Kelly, of Baltimore. Dr. Battey's fame dates back to 1872, at which time he originated and first performed Battey's operation for oophorectomy.

Dr. John W. H. Pollard,

Who is in charge of athletic work at Washington and Lee University, Lexington, Va., is spending the summer at Quincy, Ill.

Virginia Graduates in Florida.

Attesting the popularity of Florida as a location for Virginia graduates, we have recently heard of several Medical College of Virginia graduates who have located in Florida and are doing well:—Drs. S. E. Wilhoit, of the class of '14, at Quincy; J. J. Spencer, of the class of '17, in St. Augustine, and R. M. Baker, of class of '18, in Jacksonville. Also, Dr. R. O. Lyell, formerly of Warsaw, Va., is now engaged in surgical work in Miami.

The Lancet,

Founded in 1823 and issued weekly at an annual subscription price of $12.00, will hereafter be published by the Oxford University Press. Subscriptions to be mailed to American addresses should be sent to the Oxford University Press, 35 West 32nd Street, New York, but editorial communications should be sent to Oxford University Press, Amen Corner, London, E. C., England.

Lectures and Clinics on Speech Correction and Development.

A one or two months' lecture course with clinics will be given at the Northwestern University, Evanston, Ill., this summer. The first course will begin June 27 and the second on July 25. The fee is $50 a month, in advance. Detailed information may be obtained from W. B. Swift, M. D., 110 Bay State Road, Boston, Mass.

Dr. Aubrey C. Belcher,

Of Ft. Smith, Ark., has been a recent visitor at his former home in this city.

Have You Gotten Your Victory Medal?

This is a beautiful medal which is to be awarded by the U. S. Government to all men and nurses who served honorably in the United States Army during the World War. You need not have gone abroad to be eligible.

Any ex-service man or woman, or mother or father who lost a son in service, is entitled to this token. Bring or mail your discharge at once to Victory Medal Office, 1112 Capitol Street, Richmond, Va., or your nearest American Legion Post, American Red Cross, or pastor, will be glad to give you information.

Civil Service Examinations.

The U. S. Civil Service Commission, Washington, D. C., announces open competitive examinations for reconstruction aide, applications to be rated as received until further notice; and for positions of roentgenologist; associate roentgenologist; assistant roentgenologist, and junior roentgenologist, applications to be rated as received until August 1.

Both examinations are open to men and women, citizens of the United States, appointing officers to have legal right to specify sex desired in requesting certification of eligibles.

For details as to above requirements for either examination, communicate with the above named Commission.

For Sale.—

My property and practice in a thriving town in the Valley of Virginia. Good roads, schools, churches and railroad facilities. Property consists of twenty-two acres of improved limestone land set in apples. This joins my town property of three acres on which is located colonial brick house and all necessary buildings. Good practice, 95% collections. A money maker for the right party who is willing to tackle a good thing. Address all replies to "X. Y. Z.," care this journal.—(Adv.)

Wanted—

To buy an improved Virginia farm of from 50 to 100 acres, preferably located in Valley of Virginia, good roads, close to good schools, etc., and near a thriving town that would make a good location for a doctor in active practice, age 40. Address communications to "S," care this journal.—(Adv.)

Position Wanted

In doctor's office, by undergraduate nurse, with knowledge of chemistry and stenography. Willing to start on meagre salary. Address, "M. J. C.," care this journal.—(Adv.)

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Obituary Record

Dr. Allen D. Evans,

Of Christiansburg, Va., one of the most prominent physicians of the southwestern section of the State, died suddenly May 17, while returning from a visit to one of his patients. Dr. Evans was fifty-two years of age and a graduate in medicine from the University of Virginia in 1904. Since then, he had made his home in and practised at Christiansburg. He was a member of the Southwestern Virginia Medical Society and the Medical Society of Virginia. He is survived by his wife and two daughters.

THE PASSING OF A PHYSICIAN.

As we drove up the main street of the town and lighted at the courthouse door, the crowd on the streets made one think that it might be court week. Every hitching-post was taken, and automobiles of every description lined the curbing, and yet there was an air of quiet and stillness hovering over all, that betokened something more unusual than court week.

The look of sadness on the passing faces told, plainer than words, that death had entered the village and carried away someone beloved of all; and when we offered to pay the colored driver of the car that had brought us over from the station, a mile away, and he refused pay, saying, "I am doing this for the Doctor," we knew that a great man had passed, and that the people who thronged the streets were paying silent tribute to his memory.

The village church was crowded to its capacity and even in the church yard standing-room was at a premium. In the side galleries of the church, where space had been reserved for colored people, every seat was taken and, looking around on the congregation composed of white and black, one's mind harked back to the days before the sixties, and a congregation of Tender Memories kept tryst with our hearts and souls.

It is a commonly expressed sentiment nowadays that the old time bond between a people and their doctor no longer exists, but anyone who attended the funeral of Dr. A. D. Evans, of Christiansburg, knows that this sentiment is false, and that true worth and self sacrifice still bear the fruits of love and affection. G. M. M.

Dr. William James Cowardin

Died at his home in this city, May 11, after an illness of several months. He was forty-four years of age and a graduate in medicine and dentistry of the former University College of Medicine, this city. He practised dentistry in this city for over twenty years and was considered one of the ablest men in his profession. He was, for a time, connected with the dental faculty of the Medical College of Virginia. His wife, three children, and a large family connection survive him.

Dr. Cowardin was a member of the Richmond Academy of Medicine and Surgery and of the Medical Society of Virginia. At a called meeting of the Academy on May 12, the following preamble and resolutions were unanimously adopted:—

The Richmond Academy of Medicine and Surgery learns with sincerest grief of the death of one of its Fellows, Dr. William J. Cowardin. He had been in ill-health for several years, though he had relinquished his practice for but a few weeks. Though Dr. Cowardin was a graduate both in medicine and dentistry, his talents leaned toward the latter and he practised this specialty. His ability and skill ranked him amongst the foremost dentists of the city, bringing him a large practice and making friends and admirers of his patients. Though he never practised medicine, he manifested great interest therein, attending the meetings of the medical societies and constantly reading medical literature. Therefore, be it resolved,

First, That in the death of Dr. William J. Cowardin the Academy has lost a highly respected and successful practitioner.

Second, That the sympathy of this body be conveyed to his beloved wife and children.

Third, That these resolutions be spread upon the pages of the minutes of the Academy; that a copy be sent the family, and that they be published in the Virginia Medical Monthly.

(Signed) G. CHAMBERS WOODSON,
WM. S. GORDON,
RAMON D. GARCIN,
Committee.

Dr. Jesse P. Rex,

Died at his home in this city, May 21. He was forty-three years of age and a graduate in medicine from the Medical College of Virginia in 1903. His mother, a sister and two brothers survive him.

Dr. Simon Baruch,

One of the best known authorities on hydrotherapy in this country, died at his home in New York City, June 3, after a long illness. He was born in Germany 81 years ago and, after completing his academic education at the Royal Gymnasium of Posen, came to America. Here he studied medicine at the Medical College of Virginia, Richmond, from which he graduated in 1862. After this he joined the Confederate Army and served as a surgeon in the field, where he had many and varied experiences. At the close of the war, he located in Camden, S. C., where he remained until 1881 when he moved to New York. He was an ex-president of the S. C. State Medical Association and was also at one time connected with the State Board of Health of that State. Later, he was professor of hydrotherapy at the College of Physicians and Surgeons, New York. Many of his writings on this subject have been translated into French and German.